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CHEMICAL WARFARE: ARMS CONTROL AND NONPROLIFERATION

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BEFORE THE

COMMITTEE ON FOREIGN RELATIONS

AND THE

SUBCOMMITTEE ON ENERGY, NUCLEAR PROLIFERATION AND GOVERNMENT PROCESSES

OF THE

COMMITTEE ON GOVERNMENTAL AFFAIRS UNITED STATES SENATE

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CHEMICAL WARFARE: ARMS CONTROL AND NONPROLIFERATION

THURSDAY, JUNE 28, 1984

UNITED STATES SENATE,
COMMITTEE ON FOREIGN RELATIONS AND THE
SUBCOMMITTEE ON ENERGY, NUCLEAR PROLIFERATION
AND GOVERNMENT PROCESSES OF THE
COMMITTEE ON GOVERNMENTAL AFFAIRS
Washington, DC.

The committees met, pursuant to notice, at 10:14 a.m., in room SD-419, Dirksen Senate Office Building, Hon. Charles H. Percy, chairman of the Committee on Foreign Relations and chairman of the Subcommittee on Energy, Nuclear Proliferation and Government Processes, Committee on Governmental Affairs, presiding.

Present: Senators Percy, Pressler, and Biden.

The CHAIRMAN. The spread of chemical and biological weapons, items I call nightmare weapons, has not been at the top of the arms control agenda in recent years. Military thinkers have long regarded these weapons as clumsy and difficult to manage on the battlefield, and militarily much less appealing than any number of conventional weapons.

Until recently it was widely believed that the Geneva Protocol of 1925 and the Bacteriological Weapons Convention of 1972 were working effectively. So powerful was the revulsion with chemical and biological arms that no nation, even in dire emergency, would use them in warfare and risk condemnation by the entire world community. Or so we thought.

Unfortunately, recent events have cast all these assumptions into question. First, there was the evidence of Soviet use and/or provision of chemical warfare agents in Southeast Asia and Africa.

On February 9 of this year the Senate went strongly on record in stating its abhorrence of the Soviet actions when we approved Senate Resolution 201 unanimously. Now there is new and powerful evidence that these nightmare weapons, specifically mustard and nerve gas, have been used in the Iran-Iraq war.

We must conclude that some nations do not share our horror with the use of weapons like these. Condemnation by the entire world community has apparently not been an effective constraint.

Just as troubling, it appears the international treaties now in place, when put to the test, have proven flawed and incomplete. We are now awakening to the possibility that the threat posed by chemical and biological weapons to U.S. national security is much more imminent, much more tangible than we had imagined. Technology and materials for sophisticated compounds are very widely

available. They could fall into the hands of any band of terrorists anytime anywhere in the world. And as Arms Control and Disarmament Agency [ACDA] Director Adelman will testify this morning, there are roughly 15 nations that have the capability to make and use chemical weapons.

The uses of chemical weapons by the Soviets and the Iraqis are watershed events. The threat is clear: There is a very real possibility that even more countries beyond the 15 which already have this capability will decide they need chemical arms as a deterrent.

We do not want to see these nightmare weapons rapidly proliferating through some of the least stable regions of the world—something that could prove irreversible once it is begun.

This morning we will examine two ways to deal with this threat. The first is to ban the weapons totally and destroy all existing stockpiles. That is the approach we are pursuing as a country at the 40-nation Committee on Disarmament [CD] in Geneva, where earlier this year the United States presented a draft treaty to accomplish this objective.

The second approach is to try to prevent any further spread of chemical weapons manufacturing capability. This can and must be pursued now. We need not await the outcome of the Geneva negotiations before giving this undertaking the highest national priority.

Because we have an unusual situation this morning in that the Senate is taking up 18 treaties at 11 o'clock involving this committee, we will have 2 panels this morning. The first panel will consist of Kenneth Adelman, and Douglas Feith, and a representative of the Commerce Department who will present the testimony of Lionel Olmer.

Also, Senator Cohen participated in the closed portion of the hearing earlier today, but was called to a meeting at the White House and will not be able to make this open portion. I would ask, therefore, that his prepared opening statement be inserted into the record at this point.

[Senator Cohen's prepared statement of follows:]

PREPARED STATEMENT OF HON. WILLIAM S. COHEN, A U.S. SENATOR FROM MAINE

Mr. Chairman, I would like to commend you for calling this hearing on the critical issue of controlling chemical and biological weapons, which—for reasons both laudable and lamentable—has received much attention in recent months. In light of recent U.S. initiatives to promote progress in achieving stronger international controls and the break-down in Southwest Asia of existing controls, the importance of this matter is quite apparent. I am pleased that this distinguished group of witnesses is able to appear today.

The United States is an active participant in the international regimes established to control these heinous weapons. We unilaterally renounced the possession and use of chemical weapons in 1969, and later joined in negotiating and ratifying the Biological Weapons Convention which bans such possessions. We have ratified the Geneva Protocol barring first use of chemical weapons. It is entirely fitting that the United States play a leading role in efforts to achieve a complete and worldwide ban on all chemical weapons.

A decade ago, the United States and the Soveit Union agreed to begin work on a comprehensive ban on chemical weapons. Actual talks have been underway for 8 years.

The United States conducted direct bilateral talks with the U.S.S.R., but shifted its efforts in 1980 to multilateral talks in the Committee on Disarmament (CD). It apparently did so because it believed that pressure from the larger international community would facilitate progress in the talks.

The United States has pressed ahead with its efforts to achieve progress in these mutlilateral negotiations. In February 1983, Vice President Bush announced at the CD the tabling of a document detailing U.S. views on what provisions a treaty should contain. This past April, Vice President Bush again went to Geneva and presented an actual draft treaty. This draft treaty contains provisions for several forms of on-site inspection to verify compliance with a chemical weapons ban. It was the difference of views on this between the United States and the Soviet Union that led to the stalling of the earlier bilateral talks.

In the past 2 years, the Soviet Union made a series of statements indicating a willingness to consider on-site inspection as part of a treaty.

For the United States to be satisfied that a ban on chemical weapons is adequately verifiable, development of the details on this will be necessary. Because of the sensitive nature of the subject, I believe that frank discussion of these details can best be conducted in confidential, bilateral exchanges between United States and Soviet negotiators.

I commend the President for his efforts and initiative within the multilateral Conference on Disarmament and urge that these efforts continue. At the same time, I believe that the resumption of bilateral talks between the United States and the Soviet Union, which ceased in 1980, could help significantly in moving the process forward. Admiral Thomas Davies served under Presidents Nixon, Ford and Carter as Assistant Director of ACDA and was responsible for chemical weapons negotiations. He testified to the Armed Services Committee last year: "for any important treaty, there has to be a bilateral agreement between the Soviet Union and the United States before anything can really get through the multilateral committee."

A similar view was expressed by Dr. Theodore Gold, who until last month was in charage of chemical weapons matters for the Department of Defense. "Certainly, to get a treaty at some time we will have to get into serious bilateral discussions with the Soviet Union . . . ."

Last November, Senator Biden and I introduced a resolution commending the President for his efforts at the multilateral level, calling for the continuation of these efforts, and urging that he extend these efforts by proposing to the Soviet Union the resumption of bilateral negotiations. This resolution has attracted broad, bipartisan support. There are now 41 Senators co-sponsoring this measure.

Since introducing the resolution, I have raised the matter of chemical weapons control with Soviet officials and scientists in meetings in Moscow, Geneva and Washington. The response has invariably been encouraging. Hence, I was disappointed in the reportedly negative Soviet reaction to the recent U.S. proposed draft treaty on chemical weapons in the Conference on Disarment.

The issues in chemical weapons control are complex, but I believe, solvable. I believe that both sides must make good faith efforts to create a climate for successful negotiations in this and other areas. I have made several proposals in this regard and hope that they are acted upon.

I believe that the President has taken a useful step in proposing a draft chemical weapons treaty. I also think that acts such as the Soviet expression of willingness to consider limited on-site inspection measures in chemical weapons control can be helpful steps in spurring progress. Senator Biden and I, along with 39 of our colleagues, have concluded that resumption of bilateral chemical weapons negotiations could help significantly in moving the process forward. Therefore, I urge the Foreign Relations Committee to favorably report Senate Resolution 283, and I urge the Administration to implement its provisions.

The CHAIRMAN. Our first witness is Kenneth Adelman, Director of the Arms Control and Disarmament Agency. As Director of ACDA, Mr. Adelman has primary responsibility for the broad range of arms control efforts, including efforts to limit the spread of chemical weapons [CW].

You are all free to summarize and are encouraged to summarize your testimony, the full text of which will be included in the hearing record.

I am pleased that you are able to be with us today, and we look forward to your testimony.

Senator PRESSLER. Mr. Chairman.

The CHAIRMAN. Yes. Senator Pressler.

Senator PRESSLER. Could I just say I am glad to see Ken Adelman and his colleagues here. I have enjoyed working with Ken Adelman. He is courteous. On a lot of matters he consults the committee, and I have appreciated that very much. I just wanted to say that for the record. But I do not want to hold this up, so I look forward to their testimony.

The CHAIRMAN. Mr. Adelman.

STATEMENT OF HON. KENNETH L. ADELMAN, DIRECTOR, U.S. ARMS CONTROL AND DISARMAMENT AGENCY

Ambassador ADELMAN. Thank you, Mr. Chairman.

Mr. Chairman, I would like to thank you for this opportunity to appear before you. My opening statement will be very short.

I have, as Senator Pressler and you know, tried for years in this administration, at the United Nations and now at ACDA, to spread the word on the danger of these nightmare weapons that you talk about. I know that this committee has been at the forefront of these efforts, and this kind of hearing is important in that regard.

The Reagan administration has been dealing with these problems in a number of areas. Last April, Vice President Bush presented a U.S. draft treaty for a total global ban on chemical weapons to the Conference on Disarmament in Geneva. This action signifies the depth of our concern about these weapons and the intensity of our efforts to ban them.

Only a complete ban can guarantee that a country at war will not, in an hour of desperation, grab for the most terrifying weapon at its disposal. If the weapons are not there, they cannot be grabbed and they cannot be used.

The problem that we face can be stated in summary form as follows: The legal, moral and political barriers that the civilized world erected after World War I are in danger of crumbling. After the experience of a million casualties on the fronts of World War I in the 1915–17 period the international community gathered together, entered into the kind of treaties that you discussed, Mr. Chairman, and did not use chemical weapons on a large scale for some 50 years.

In more recent time, the Soviets have been using chemical weapons in Southeast Asia, in Afghanistan; and now, with the Iraq-Iran war, the barriers are in danger of crumbling. You know from your experience with the nonproliferation regime, that the Non-Proliferation Act is an important step in the effort to establish an international norm against the spread of nuclear weapons. Likewise, the draft treaty that Vice President Bush tabled in Geneva is part of our attempt to establish an international norm, a standard of behavior, such that use of chemical weapons is as deplorable to leaders of other countries, to international organizations and to public opinion around the world as the spread of nuclear weapons would be.

Now, this is a very difficult effort to pursue, but it's a very important effort to pursue, and it's one that is at the heart of our activities in Geneva.

Let me say finally, Mr. Chairman, that the use of chemical weapons that has caused us concern in Southeast Asia and in Afghani-

stan seems, according to reports, to have been dwindling in terms of the number of incidents and the toxicity of the use there. But we have to be very wary of these reports because intelligence on these kinds of matters is not always reliable.

If it is true that the number of attacks and their toxicity have been declining over the last year, then I think that the reduction has resulted in some measure from the efforts that this committee has made, that we have made at the United Nations, and that the President has made in arousing public opinion and raising the international standard.

I think that this shows that we have to keep up the pressure, keep up the intensity. In the vast realm of arms control, this is an area where the executive and legislative branch can work together, where Republicans and Democrats can work together, where there has not been any kind of division that hobbles us as in other areas of arms control.

I would be glad Mr. Chairman, to submit my prepared statement for the record and to move along to questions if you would like.

[Mr. Adelman's prepared statement follows:]

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PREPARED STATEMENT OF HON. KENNETH L. ADELMAN

MR. CHAIRMAN:

I welcome the opportunity to appear before you today. The use of chemical weapons and their proliferation are among the most disturbing developments of our age.

The Reagan Administration has been dealing with these problems on a number of fronts. Last April Vice President Bush presented the US draft treaty for a total global ban on chemical weapons to the Conference on Disarmament in Geneva. This action signified the depth of our concern about these weapons -- and the intensity of our efforts to ban them.

Only a complete ban can help guarantee that a country at war will not, in an hour of desperation, grab for one of the most terrifying weapons at its disposal. If the weapons are not there, they cannot be grabbed, not be used.

Moscow promptly labeled the proposal -- described by Pravda earlier as a lot of "noise" -- as a propaganda ploy containing "patently unacceptable conditions for verification."

No doubt about it: Chemical weapons pose some of the most confounding verification problems encountered in the arms control realm. For this very reason, we are seeking some new and rather bold approaches, including an "open invitation" for international inspection on short notice of all military and government-controlled facilities.

This "open invitation", granting access to suspect sites, is far-reaching. Some people have said it is unacceptable. We hope not. Some have also said it is one-sided since everything is government controlled in the Soviet Union and relatively little

is so controlled in the United States. That argument does not stand up. We neither contemplate nor desire such imbalance in burdens. We have made clear our readiness to negotiate so that the approach applies fairly to differing economic and political systems.

Overcoming the problems of verification is essential -- arms control is empty without compliance and compliance is not believable without verification, particularly in a closed society. A ban on chemical weapons honored by open societies and violated by closed societies would constitute no ban at all; it would constitute unilateral disarmament in the guise of multilateral arms control.

The "noise" that Pravda wrote about does not derive from any United States propaganda. Rather, it comes from chemical weapons used by the Soviet Union in Afghanistan, by Soviet surrogates in Southeast Asia and by Iraq against Iran. The "noise" comes not just from the cries of victims but also from the crumbling of the political, moral and legal barriers against the use of chemical weapons.

Those barriers were erected intensively and extensively more than six decades ago, following the horrible experience with noxious gases that claimed some 90,000 victims and caused more than one million casualties during World War I. In 1915, clouds of chlorine gas rolled across the battlefields in Belgium. A Major Auld wrote that year:

> "Try to imagine the ... troops as they saw the vast cloud of greenish-yellow gas spring out of the ground and slowly

move downwind toward them, the vapour clinging to the earth, seeking out every hole and hollow ... First wonder, then fear; then, as the first fringes of the cloud enveloped them and left them choking and agonized in the fight for breath - panic. Those who could move broke and ran, trying, generally in vain, to outstrip the cloud which followed inexorably after them."

With that grim lesson so fresh in mind, the international community moved in 1925 to outlaw the use of chemical weapons. Chemical weapons were used in Ethiopia by the Italians in the 1930's, but no nation used them for 30 years thereafter.

In the late 60's, however, evidence of chemical weapons use appeared on an obscure battlefield in Yemen; they were almost certainly supplied by the Soviets. In the mid-1970's, the Hmong people in Laos became the next victims of chemical warfare, followed in 1978 by the Cambodian people. In 1979 we received reliable reports of chemical weapons use by Soviet forces in Afghanistan, a practice that continued into the 80's. And Vietnamese and Lao troops, Soviet surrogate forces, continued to use toxic agents against the Lao and Cambodian people. Then, just recently, the world witnessed Iraq using chemical weapons in its miserable war against Iran.

All this despite two major international agreements that restrict the use of chemical weapons. The first is the 1925 Geneva Protocol, prohibiting the use in war of asphyxiating, poisonous or other gases. The Soviets joined it in 1928, Iran in 1929, and Iraq in 1931. It has been a major bulwark against

chemical weapons use with more than 100 countries party to the protocol. But it is now in danger of crumbling by some parties' disregard for their own obligations.

The second treaty is the 1972 Biological and Toxin Weapons Convention which prohibits the development, production, transfer and stockpiling of biological and toxin weapons. Toxins are chemicals which are ordinarily produced by biological processes, but some can be synthesized in a laboratory. The Soviet Union has been a party to the Convention since 1975; Laos since 1973 and Vietnam since 1980. All have violated it.

We need now to reestablish and further buttress the long-standing practices of decent international behavior. This process is more critical today than ever, for today more threatening and toxic killer chemicals are available than ever. They are the poor state's weapons of mass destruction, and the poor man's weapons of mass suffering. And, as the Iraqi example makes clear, they are relatively cheap and easy to produce.

The United States has been on the forefront of this moral and political campaign, as it should be, over the past three Administrations. When I arrived at the United Nations in 1981 as Deputy U.S. Representative, I found that the groundwork had been laid to press for a halt to the use of chemical weapons. During my nearly two years there, I tried to build on this foundation through missionary work to stop this use, to help the victims, and to ensure that there would be no more use and no further spread of these horrible weapons.

As our most recent report to the United Nations noted, the use of toxic agents in Southeast Asia apparently declined in 1983. Indications are that fewer and less toxic agents were being used such as nonlethal incapacitating or riot-control agents. In Afghanistan, there were only unconfirmed reports of chemical attacks in 1983.

This news is welcome to the extent it is accurate. We hope these practices will be stopped entirely. We also hope that world attention will remain fixed on this problem and on the need to strengthen the barriers against chemical weapons use and then to ban the weapons altogether. For our part, we will do everything we can to ensure that this problem receives the leadership it needs.

Three key courses comprise this leadership: first, negotiating a complete and effective ban on all chemical weapons; second, fixing world attention on the problem of the use of these weapons and the dangers of their proliferation; third, safeguarding Western interests by maintaining a credible chemical weapons deterrent capability until such time as a comprehensive treaty is concluded. The three are, of course, related. The mere act of our proposing a total chemical weapons ban helps rivet world attention on the issue, thereby helping to reestablish international norms long respected and now endangered.

We will need to continue to demonstrate our leadership in other areas as well, particularly on the export control front. Export controls were imposed effectively and quickly to ensure that products from the United States do not contribute to chemical

weapons in the Iraq-Iran war. Our action has not only been effective domestically, but the example has been followed by other countries. I refer you to the statement being submitted for the record by Undersecretary of Commerce Olmer for further details on export control. I have mentioned it as another important example of US leadership.

Mr. Chairman, we must work to achieve our goals of eliminating chemical weapons. We need to work together on this noble pursuit.

Thank you.

The CHAIRMAN. Thank you very much, and I appreciate the way you have summarized your testimony. The full text will be incorporated in the record.

The next witness is Douglas Feith, Deputy Assistant Secretary, Department of Defense. The Department of Defense necessarily has a very important role in our efforts to protect the United States posed by the threat of chemical weapons.

Again, your testimony can be summarized, and we are pleased to have you here.

STATEMENT OF HON. DOUGLAS J. FEITH, DEPUTY ASSISTANT SECRETARY OF DEFENSE (NEGOTIATIONS POLICY), ACCOMPANIED BY MS. AMORETTA M. HOEBER, PRINCIPAL DEPUTY ASSISTANT SECRETARY OF THE ARMY FOR RESEARCH, DEVELOPMENT AND ACQUISITION, DEPARTMENT OF DEFENSE; AND VINCE DE CAIN, DEPARTMENT OF COMMERCE

Mr. FEITH. Thank you, Mr. Chairman.

I am accompanied today by Amoretta Hoeber, Principal Deputy Assistant Secretary of the Army for Research, Development and Acquisition.

Mr. Chairman, I have prepared a written statement which, with your permission, I will submit for the record. I would like for my opening remarks to highlight certain sections of that statement.

Though the initiation of chemical warfare is rejected by the collective conscience of the civilized world, a number of countries have repeatedly resorted to such warfare in recent years. This tells us something about the scope of the civilized world which, alas, is far narrower than the world itself. It tells us something about the influence of the civilized world's conscience, which lacks potency even when reflected in so formal, venerable and multilateral a document as the 1925 Geneva Protocol. And it tells us something about the attractiveness of toxic chemicals as offensive weapons in the view of certain parties under certain circumstances.

What is the nature of this attractiveness? It has sometimes been said that chemical agents make ineffective weapons in that the chief effect of chemical weapons use in Europe, for example, would be to kill civilians in the vicinity of the battle. The implication is that chemical weapons are a danger only in the hands of vandals or purposeless murderers. If that were true, the likelihood that more countries and paramilitary organizations, too, will obtain and use chemical weapons would be small. In fact, however, the dangers of CW proliferation inhere in the widespread belief that chemical weapons are well suited to the accomplishment of a number of military missions.

Chemical weapons can devastate fixed targets. They provide a relatively easy means of shutting down headquarters buildings, communications centers, airfields, hospitals and storage depots. The net military value of a CW attack to the attacker can be great, and all the more so if the side attacked refrains from retaliation in kind.

Chemical weapons serve also as instruments of demoralization and terror and not just for nongovernmental terrorist groups. The gruesome characteristics that render offensive use of such weapons

an anathema to humane nations render them a prize to terrorists and to those who would induce mass flight on the part of unprotected civilians and soldiers.

The Iraqis, for example, appear to have used mustard and nerve gas against Iranian forces at least as much for the anticipated psychological effects—demoralization and fear—as for the casualties directly inflicted.

An armed force attacked with chemicals cannot through the use of protective gear negate the military value to the attacker. Neither a radio operator nor a mechanic nor a surgeon nor a combat soldier can perform his mission over an extended period while encased in the protective equipment. Even if the use of chemical weapons accomplishes nothing other than compelling the other side to wear protective gear, it can be decisive.

To appreciate the magnitude of the risk of proliferation, this grim review of chemical weapons' utility must be considered in light of the costs entailed in their acquisition. In a word, the costs are low. CW is not high technology. The ingredients are not particularly expensive. Production is easy to conceal; as we have seen in Iraq, insecticide factories can serve as cover.

In sum, proliferation and increased use of chemical weapons are disturbingly likely prospects because toxic chemicals are an altogether attractive weapon for thrifty, unscrupulous aggressors in a world where international law is often little more than talk and not even much of that.

The Reagan administration's major initiative to deal with this problem is the draft treaty which Vice President Bush introduced this past April in the Conference on Disarmament in Geneva which would ban the development, production, stockpiling, acquisition, retention and transfer of chemical weapons as well as their use.

The inherent value of the proposal may not be readily discernible. The history of arms control agreements, especially those on chemical and biological warfare, is not inspirational, and in particular, the Soviets' lengthy record of violations militates against any undertaking predicated either on our antagonists' faithfulness or the universal constraining power of international legal documents.

I understand we are under severe time constraints, and I will stop there.

The CHAIRMAN. Is that a logical place for you to stop?

Mr. FEITH. I believe it is.

The CHAIRMAN. Is there any final summary you want to put on it.

Mr. FEITH. I was intending to address the question of verification provisions in our treaty. If you would like to get into that, we could perhaps deal with it in the questions and answers.

[Mr. Feith's and Mr. Olmer's prepared statement follow:]

PREPARED STATEMENT OF HON. DOUGLAS J. FEITH

In holding these hearings, your committees are directing attention to perils that the Reagan Administration deems grave and growing. We have in recent months devoted much intense work to the problem of chemical weapons proliferation and to the challenges of the chemical weapons threat generally, and I welcome this chance to discuss that work with you.

Though the initiation of chemical warfare is rejected by the collective conscience of the civilized world, a number of countries have repeatedly resorted to such warfare in recent years. This tells us something about the scope of the civilized world, which alas is far narrower than the world itself. It tells us something about the influence of the civilized world's conscience, which lacks potency even when reflected in so formal, venerable, and multilateral a document as the 1925 Geneva Protocol. And it tells us something about the attractiveness of toxic chemicals as offensive weapons in the view of certain parties under certain circumstances.

What is the nature of this attractiveness?

It has sometimes been said that chemical agents make ineffective weapons and that the chief effect of chemical weapons use in Europe, for example, would be to kill civilians in the vicinity of the battle. The implication is that chemical weapons are a danger only in the hands of vandals or purposeless murderers but not in the hands of a serious-minded adversary such as the Soviet Union. If that were true, the likelihood that more countries

(and paramilitary organizations too) will obtain chemical weapons and use them would be small. In fact, however, the dangers of CW proliferation inhere in the widespread belief that chemical weapons are well-suited to the accomplishment of a number of military missions.

Chemical weapons can devastate fixed targets. They provide a relatively easy means of shutting down headquarters buildings, communication centers, airfields, hospitals, and storage depots. Consider for a moment an attack with persistent nerve agent on an ordinary ammunition depot; the side attacked can either write off the depot's supplies or it can deploy them, thereby increasing the range of contamination and compelling its own soldiers far away to don cumbersome protective suits--which resemble space suits--in order to handle the ammunition. The net military value of such an attack to the attacker can be great, and all the more so if the side attacked refrains from retaliation in kind.

Chemical weapons serve also as instruments of demoralization and terror (and not just for non-governmental terrorist groups). The gruesome characteristics that render offensive use of such weapons an anathema among humane nations render them a prize to terrorists and to those who would induce mass flight on the part of unprotected civilians and soldiers. The Laotians' use of Soviet-supplied chemical and toxin weapons, in addition to causing many deaths, has driven thousands of Hmong tribesmen from their homes in Laos across the border to refugee camps in Thailand. And the Iraqis appear to have decided to use mustard and nerve

gas against Iranian forces, few of whom have protective gear of any kind, at least as much for the anticipated psychological effects--demoralization and fear--as for the casualties directly inflicted.

An armed force attacked with chemicals cannot through the use of protective gear negate the military value to the attacker. Such gear, though essential to protect the lives of troops in the contaminated area, inevitably undermines their effectiveness. Neither a radio operator, nor a mechanic, nor a surgeon, nor a combat soldier can perform his mission over an extended period while encased in the protective equipment. Even if the use of chemical weapons accomplishes nothing other than compelling the other side to wear protective gear, it can be decisive.

To appreciate the magnitude of the risk of proliferation, this grim review of the utility of chemical weapons must be considered in light of the costs entailed in their acquisition. In a word, the costs are low. CW is not high technology. The ingredients are not particularly expensive. Production is easy to conceal; as we have seen in Iraq, insecticide factories can serve as cover (insecticide, after all, is nerve gas for insects).

In sum, proliferation and increased use of chemical weapons are disturbingly likely prospects because toxic chemicals are an altogether attractive weapon for thrifty, unscrupulous aggressors in a world where international law is often little more than talk and not even much of that.

The U.S. Government is addressing this problem from a number of angles. The two on which these hearings focus are export controls and President Reagan's new proposal for an international comprehensive treaty to ban chemical weapons.

The issue of export controls is being handled here primarily by my colleague from the Commerce Department. I wish only to caution against excessively high expectations about the effectiveness of controls.

It is true that through vigilant intelligence work and skillful execution, a chemical weapons export control policy can achieve valuable objectives, such as the disruption of a given state's plans to produce CW quickly for immediate use in battle and the imposition of higher economic costs on such a state. But no export control policy can erect an insurmountable barrier against acquisition or at-home production of CW. With very few exceptions, the chemicals used to make CW also have peaceful industrial or agricultural uses, so one cannot flatly ban commerce therein. The key percursor chemicals for CW production are numerous; each is fungible, can be substituted for, and is supplied by a sizeable number of firms located in several countries. Therefore, while export control successes are possible in specific instances if international cooperation is forthcoming--as in the recent case of the embargo against shipment of certain items to Iraq--no controls can reasonably be expected to block a determined country for a long time from acquiring chemical weapons. The problem is not the inadequacy of our laws or their enforcement;

it is the nature of the chemicals in question.

The Reagan Administration's major initiative to reduce the risks of CW proliferation and use is the draft treaty which Vice President Bush introduced this past April in the Conference on Disarmament in Geneva. Unlike the 1925 Geneva Protocol, which bans in effect only the first use in war of chemical weapons, the treaty the United States is now proposing is comprehensive in that it would ban the development, production, stockpiling, acquisition, retention, and transfer of chemical weapons, as well as their use.

The inherent value of this new treaty proposal may not be readily discernable. The history of arms control agreements--especially those on chemical and biological warfare--is not inspirational. And in particular the Soviets' lengthy record of violations of these agreements militates against any undertaking predicated either on our antagonists' faithfulness or the universal constraining power of international legal documents.

Though we in the U.S. Government embark on this CW treaty initiative without illusion, we embark with the belief that the conclusion of a treaty along the lines we have proposed would yield the United States and the international community certain benefits. It would first of all increase the costs of activities like CW production and stockpiling for those parties inclined to engage in them both illicitly and without detection; concealment comes only at a price, though of course that price is lower for closed societies than for open ones. Secondly, if the treaty

were adhered to in peacetime, it would diminish somewhat the chances of CW use in war; first producing and then using chemical weapons during a war obviously entails greater effort than simply using ready stocks. And third, the international community's adoption of our treaty proposal would, we hope, raise in some degree the political penalties against chemical weapons use, such as they are. I make this last point without wishing to encourage fond or undue reliance on such penalties.

To be serious about arms control, we must acknowledge that the conclusion of a comprehensive CW ban, even one along the lines of the U.S. proposal, would not in and of itself eliminate the problem of chemical warfare, even among the parties themselves. But we should not belittle the importance of the benefits just mentioned. The Reagan Administration attaches enormous importance to them and is committed wholeheartedly to the negotiation of a treaty that will actually ban chemical weapons comprehensively.

As for the question of whether it makes sense to negotiate additional arms control treaties with states like the Soviet Union that have histories of not abiding by their treaties, the answer must be: It depends. One can strike a mutually beneficial deal even with an individual or organization of manifest lack of integrity. A prudent man, however, will insist that there be built into the deal certain protections that he would not insist on if he trusted in the other party's honesty. The prudent man who knowingly enters into an agreement with a proven cheater will

take pains to ascertain that he is getting what he bargained for. This is elementary. And it is why the Reagan Administration concerns itself with the verification provisions of arms control proposals. Governments adopt such proposals because they expect compliance from the other parties. If it would be impossible to ascertain--or verify--whether the others are in fact complying, it would be pointless to conclude a formal agreement, especially with states like the Soviet Union.

Which brings us to the verification provisions of the new CW treaty proposal. The problems we confronted in devising those provisions are formidable and were outlined by Vice President Bush in Geneva:

> [T]he technical similarities between chemical weapons production facilities and commercial production facilities, the similarity between chemical weapons agents and chemicals for peaceful uses, and the similarity between chemical munitions and conventional munitions makes discrimination impossible without very close observation.

Chemical munitions are small, easy to hide, easy to produce clandestinely, and militarily significant even in modest quantities. Keeping track of other countries' CW production and stockpiling is a hard chore (especially if hose countries have closed societies and have taken pains to conceal) and losing track, after one has signed onto a CW ban, would create grave military dangers.

While the United States and its NATO allies are constrained by their respective political systems (let alone their innate respect for law) to abide by the terms of any CW ban they ratify, the Soviet Union is not. An opportunity to violate the ban without detection would likely prove irresistable to the Soviet government, for the Soviet military is unsurpassed in its pursuit of chemical war-fighting capabilities, though it is not distinguished by its legal scruples. For a defensive alliance like NATO, the military risks inherent in a Soviet or Warsaw Pact CW monopoly vis-a-vis NATO are unacceptable. Were the West to establish such a monopoly it would be inviting, in the event of war, the one-sided use by Eastern forces of chemical weapons, which would, we anticipate, increase the pace of the Warsaw Pact attack and lower the nuclear threshold, consequences we have a compelling interest in averting.

Given the strategic stakes at risk and given that an unverifiable ban would be tantamount to a Soviet bloc CW monopoly vis-a-vis NATO, the Administration concluded that the extraordinary difficulties of CW verification require extraordinary measures in our treaty proposal. Hence the much-discussed Article X, which would commit the parties to open for international inspection on short notice all of their military and government-owned or government-controlled locations and facilities.

That such a provision is indispensible to a comprehensive CW treaty became clear to the Administration as we broke down the verification problem analytically. In his Geneva speech, the Vice

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President reviewed the analysis:

> The goal of our proposal is a treaty to require states to declare the sizes and locations of their chemical weapons stocks and their production facilities, to destroy the stocks and facilities and to foreswear creating any new chemical weapons.
>
> If they are to sign such a contract, states must have confidence, in particular, that they can know:
>
> > First, that all stocks have been destroyed;
> >
> > second, that all declared production facilities have been destroyed;
> >
> > third, that the declared stocks really do constitute all the stocks;
> >
> > and fourthly, that the declared facilities are all the facilities.
>
> Without such firm assurance we cannot--and I think everybody here knows this--we cannot claim to have banned chemical weapons.

The first two propositions are relatively easily established. This past January, Soviet officials, addressing the issue of verification of the destruction of declared stocks, effectively acknowledged the legitimacy of our long-standing insistance on permanent on-site inspection. As that principle is established and the

technology for monitoring the destruction of declared stocks and facilities is within our grasp, we do not view the first two propositions as stumbling blocks.

Ascertaining, however, that the declarations of stocks and facilities are complete and that nothing is being hidden is a problem many orders of magnitude more difficult. We see no way of addressing it satisfactorily other than through the so-called Open Invitation challenge inspection provision (Article X) of our draft treaty. No non-mandatory provision nor any provision of narrower scope can afford us due confidence regarding possible hidden stocks or clandestine production. Having called attention to the role of verification measures in deterring cheating, Vice President Bush in Geneva characterized the Open Invitation provision as "indispensible" and "the sine qua non of an effective chemical weapons ban."

The Reagan Administration's decision to propose Open Invitation challenge inspections followed profound and even agonizing deliberations throughout the Administration. Article X would commit the United States to an unprecedented degree of openness. It might entail sacrifices of certain national security secrets and this gave pause to us all. The President, recognizing that such a risk would be necessary for an effective CW ban, faced a rather stark choice. He could decide that we are willing to pay the price of an effective ban, or he could decide that it is senseless to pursue the CW negotiations. There was no realistic third option, for it would be irresponsible to judge an effective

ban too costly and then pursue an unverifiable or ineffective ban. His endorsement of Article X's Open Invitation provision reflected the hope that, through its acceptance by the international community (again to use the Vice President's words):

> [We] will not only have realized the noble longing for a treaty that actually bans chemical weapons, but we will have changed in an altogether salutory manner the way governments do business.
>
> We will have set a bold example for ov rcoming barriers that impede effective arms control in other areas. And we will have engendered the kind of openness among nations that dissipates ungrounded suspicions and allows peace to breathe and allows peace to thrive.

Administration officials are frequently asked about chances that the Soviet Union will agree to Article X. While we earnestly desire their agreement, Russia's historical secretiveness, aggravated by communist rule, keeps hope in check. Our interlocutors sometimes say that this means our CW initiative is not "serious."

This travesty of language deserves exposure. A serious arms control proposal is one which, if accepted by the other parties, would actually accomplish what it purports to accomplish. The U.S. Government's CW ban proposal is serious because its acceptance by the international community would actually result in an effective ban. The Soviets have so far endorsed only proposals that would

allow them to hide CW stocks and production despite the ban, which we must assume they would do. It is an offense against diction and logic to make their willingness to accept a proposal the determinant of the proposal's seriousness. The Washington Post's April 6, 1984 editorial on the Administration's CW treaty initiative is noteworthy on this point: "That the Soviet Union, a direct practitioner and apparent indirect sponsor of a form of war it solemnly renounced, may object to rigorous inspection is not an argument against it."

There is a tie-in among the concepts of verification and treaty enforcement and the dangers of CW proliferation which warrants comment as a closing point. The likelihood of CW proliferation and increased CW use is symptomatic of the contempt in which international legal norms are held in important quarters of the world community. It is a puzzle that the growth of such contempt should be accompanied by skyrocketing expectations in the Western world about the efficacy of arms control treaties as national security safeguards. In any event, it is important to note that this contempt is fed by the reluctance (and often unwillingness) of law-abiding states and individuals to probe deeply into apparent violations of arms control treaties and to raise a hue and cry against states that improperly impede such probes and states proven to be treaty violators. The mentality that fears the effects on the arms control process of highlighting treaty violations more than it fears the harm caused by the violations themselves gives rise to impossible demands for absolute proof of treaty violations. If such proof were required in our domestic criminal courts, we

would suffer anarchy, for no one would be convicted, notwithstanding our domestic courts' power to subpoena evidence and require witnesses to testify and undergo cross-examination. The United States in the court of world opinion has no such power to compel testimony. Yet, in some people's view, our burden of proof never shifts to the alleged violator.

Common passivity in the face of apparent and proven treaty violations, rationalized through insistence on standards of proof unrealistic even for scientific laboratories, let alone the international diplomatic community, creates powerful incentives for the Administration to insist on the utmost in verification stringency. In other words, it eliminates, for other countries, important disincentives against cheating. For all of us who would reduce the danger of chemical weapons use in the future and would foster the attainment of new, prudent and effective arms control treaties, our first duty is to concern ourselves with the integrity of the many arms control agreements already on the books.

STATEMENT OF

LIONEL H. OLMER

UNDER SECRETARY FOR INTERNATIONAL TRADE

U.S. DEPARTMENT OF COMMERCE

BEFORE A JOINT HEARING OF THE

SENATE FOREIGN RELATIONS COMMITTEE

AND THE

SENATE SUBCOMMITTEE ON ENERGY, NUCLEAR

PROLIFERATION AND GOVERNMENT PROCESSES

OF THE

COMMITTEE ON GOVERNMENTAL AFFAIRS

JUNE 28, 1984

I AM PLEASED TO HAVE THIS OPPORTUNITY TO SUBMIT MY COMMENTS FOR THE RECORD ON THE IMPORTANT SUBJECT OF CHEMICAL WARFARE. I REGRET THAT OTHER COMMITMENTS MAKE IT IMPOSSIBLE FOR ME TO APPEAR BEFORE THE COMMITTEE TODAY.

THE DEPARTMENT OF COMMERCE HAS A LONG AND CONTINUING HISTORY OF MAINTAINING AND UPDATING CONTROLS ON COMMODITIES UNDER ITS JURISDICTION THAT HAVE POTENTIAL USES IN CHEMICAL OR BIOLOGICAL WARFARE. WE HAVE, OVER TIME, BEEN ABLE TO DEVELOP APPROPRIATE ADMINISTRATIVE MECHANISMS TO RESPOND QUICKLY TO THE NEED TO IMPOSE CONTROLS. WE HAVE ALSO CONTINUOUSLY ENGAGED IN A SYSTEMATIC REVIEW OF OUR CONTROL PROGRAMS IN ORDER TO ANTICIPATE FUTURE SITUATIONS AFFECTING OUR IMPORTANT EXPORT CONTROL MISSION.

AT PRESENT, COMMODITIES THAT HAVE POTENTIAL USES IN CHEMICAL OR BIOLOGICAL WARFARE ARE CONTROLLED AS FOLLOWS: CHEMICAL WARFARE AGENTS ARE ON THE MUNITIONS CONTROL LIST, WHICH IS ADMINISTERED DIRECTLY BY THE DEPARTMENT OF STATE. DUAL-USE CHEMICALS THAT ARE DIRECT PRECURSORS TO CHEMICAL AGENTS ARE CONTROLLED BY THE DEPARTMENT OF COMMERCE AND HAVE BEEN SINCE THE EARLY 1960'S. EXPORT CONTROLS FOR OTHER CHEMICALS THAT ARE PRIMARILY USED IN LEGITIMATE CIVIL APPLICATIONS, BUT WHICH HAVE POTENTIAL USE IN CHEMICAL WEAPONS, ARE MOSTLY FREE FROM CONTROL.

WHEN WE WERE FIRST ALERTED LAST MARCH TO THE POSSIBILITY THAT LARGE QUANTITIES OF ONE U.S.-ORIGIN CHEMICAL WOULD BE EXPORTED WHICH COULD BE USED IN THE MANUFACTURE OF CHEMICAL WARFARE AGENTS IN THE

IRAQ/IRAN WAR, OUR REVIEW REVEALED THAT THE CHEMICAL IN QUESTION WAS NOT SUBJECT TO NATIONAL SECURITY OR FOREIGN POLICY CONTROLS.

THE DEPARTMENT OF STATE LED INTERAGENCY DISCUSSIONS RELATING TO THE IMPOSITION OF FOREIGN POLICY CONTROLS ON THIS CHEMICAL. THESE DISCUSSIONS INVOLVED COMMERCE, DEFENSE AND THE INTELLIGENCE COMMUNITY. WE DETERMINED THAT THIS CHEMICAL COULD BE USED FOR CHEMICAL WEAPONS MANUFACTURE FOR USE IN THE IRAN/IRAQ WAR. HAVING IDENTIFIED THE ONE CHEMICAL, THE INTERAGENCY GROUP DISCOVERED THAT THERE WERE OTHERS THAT SHOULD BE CONTROLLED, AND ACTION WAS DELAYED BRIEFLY UNTIL A LIST OF A TOTAL OF FIVE CHEMICALS WAS DEVELOPED.

THE SECRETARY OF STATE FORMALLY RECOMMENDED TO THE SECRETARY OF COMMERCE THAT THE FIVE CHEMICALS BE PLACED UNDER FOREIGN POLICY CONTROLS REGARDING IRAQ AND IRAN. THE COMMERCE DEPARTMENT CONDUCTED THE NECESSARY CONSULTATIONS WITH CONGRESS AND WITH INDUSTRY THAT ARE REQUIRED BY THE EXPORT ADMINISTRATION ACT WHEN IMPOSING NEW CONTROLS FOR FOREIGN POLICY PURPOSES. MANUFACTURERS OF THE FIVE CHEMICALS WERE NOTIFIED THAT THE CONTROLS WERE EFFECTIVE IMMEDIATELY, AND WERE ASKED TO PROVIDE INFORMATION ON AVAILABILITY TO IRAN/IRAQ OF THE CHEMICALS FROM OTHER COUNTRIES, SO THAT THE DEPARTMENT OF STATE COULD CONSULT WITH OUR ALLIES AND OTHER NATIONS TO OBTAIN INTERNATIONAL COOPERATION IN CONTROLLING SUCH CHEMICALS. I UNDERSTAND THAT, TO DATE, THE UNITED KINGDOM, WEST GERMANY, THE NETHERLANDS AND FRANCE HAVE IMPOSED SIMILAR CONTROLS, AND THAT

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CANADA, WHICH DOES NOT PRODUCE ANY OF THE FIVE CHEMICALS, HAS ISSUED REGULATIONS TO CONTROL THE RE-EXPORT OF U.S.-ORIGIN CHEMICALS TO EITHER OF THE TWO WARRING PARTIES.

FROM THE TIME THAT COMMERCE FIRST RECEIVED INDICATIONS THAT EXPORT CONTROLS ON CHEMICALS DESTINED TO IRAQ AND IRAN WOULD BE NECESSARY (ON OR ABOUT MARCH 15), UNTIL NOON OF MARCH 30, COMMERCE, IN COORDINATION WITH OTHER AGENCIES, (1) HAD IDENTIFIED THOSE CHEMICALS THAT NEEDED TO BE BROUGHT UNDER FOREIGN POLICY CONTROLS, (2) CONDUCTED NECESSARY INDUSTRY AND CONGRESSIONAL CONSULTATIONS, (3) MADE PRELIMINARY ASSESSMENTS OF FOREIGN AVAILABILITY FOR USE BY THE STATE DEPARTMENT IN ITS EFFORTS TO OBTAIN COMPLEMENTARY CONTROLS FROM OTHER NATIONS, AND (4) AND ISSUED REGULATIONS PREVENTING THE EXPORT OF THE CHEMICALS TO IRAQ OR IRAN WITHOUT U.S. GOVERNMENT AUTHORIZATION.

AS A RESULT OF THE PROMPT IMPOSITION OF THE CONTROLS, AT LEAST ONE LARGE SHIPMENT OF CHEMICALS DESTINED FOR USE IN CHEMICAL WARFARE WAS PREVENTED. I AM VERY PROUD OF THE OFFICE OF EXPORT ADMINISTRATION WHICH ADMINISTERS THE COMMERCE EXPORT CONTROL PROGRAM FOR THE SPEED WITH WHICH THEY ACTED IN THIS CASE.

THE CONTROLS IMPOSED ON MARCH 30 ARE A GOOD EXAMPLE OF A SITUATION IN WHICH THE U.S. GOVERNMENT HAD TO MOVE QUICKLY TO PREVENT EXPORTS DETRIMENTAL TO U.S. FOREIGN POLICY CONCERNS AND WAS ABLE TO DO SO.

DESPITE THE EXPEDITED PROCEDURES, THERE WAS FULL COMPLIANCE WITH THE REQUIREMENTS OF THE EAA, AND CAREFUL TECHNICAL REVIEW TO IDENTIFY ONLY THOSE CHEMICALS THAT WARRANTED ADDITIONAL EXPORT CONTROL.

THE DEPARTMENT OF COMMERCE HAS BEEN, AND CONTINUES TO BE, ENGAGED IN REVIEW OF EXPORT CONTROLS DESIGNED TO RESTRICT EXPORT OF CHEMICAL AGENTS USED OR USEFUL IN CHEMICAL WARFARE. THE DEPARTMENT HAS CONTROLLED DIRECT PRECURSORS TO CHEMICAL WARFARE AGENTS FOR TWO DECADES AND REVIEWS AND UPDATES THE CONTROLLED COMMODITIES PERIODICALLY. THE MARCH 30 ACTION WAS DESIGNED TO COVER GENERALLY CIVIL-USE CHEMICALS THAT WE DETERMINED TO HAVE USES IN CHEMICAL WARFARE. AN INTERAGENCY GROUP CONTINUES TO MEET TO DETERMINE IF ANY ADDITIONAL COMMODITIES SHOULD BE CONTROLLED.

AN IMPORTANT RELATED AREA IN WHICH WE ARE CURRENTLY EXAMINING U.S. EXPORT CONTROLS IS IN THE FIELD OF BIOTECHNOLOGY. BIOTECHNOLOGY ENCOMPASSES MAN'S ABILITY TO SPECIFICALLY MODIFY MICROORGANISM AND ENZYME SYSTEMS TO PRODUCE DESIRED END-PRODUCTS. IT INCLUDES FERMENTATION, WHICH MAN HAS USED FOR THOUSANDS OF YEARS, AND THE DEVELOPMENT OF ANTIBIOTICS, WHICH MAN HAS USED FOR THE PAST HALF-CENTURY OR SO. WHILE IN SUCH RESPECTS BIOTECHNOLOGY IS AN ESTABLISHED FIELD, IN MANY AREAS, ESPECIALLY WHERE RECOMBINANT GENETICS IS CONCERNED, IT IS A RAPIDLY EMERGING TECHNOLOGY WITH POTENTIALLY SIGNIFICANT MILITARY AS WELL AS CIVIL USES. IN EXAMINING THE QUESTIONS OF EXPORT CONTROLS, WE WILL HAVE TO CONSIDER

NOT ONLY THE TECHNOLOGY AND RESULTING COMMODITIES, BUT THE SOPHISTICATED INSTRUMENTATION AND MANUFACTURING PROCESS AND EQUIPMENT AS WELL. GIVEN THE INTERNATIONAL NATURE OF BIOTECHNOLOGY RESEARCH AND CAPITALIZATION, AS WELL AS THE SHEER SPEED WITH WHICH WE EXPECT BREAKTHROUGHS TO OCCUR IN THIS FIELD, IT IS ESSENTIAL THAT WE KEEP ABREAST OF DEVELOPMENTS IN ORDER TO PREVENT EXPORTS OF BIOTECHNOLOGY DETRIMENTAL TO OUR NATIONAL SECURITY OR FOREIGN POLICY CONCERNS. AS RECOMMENDED BY THE WHITE HOUSE OFFICE OF SCIENCE AND TECHNOLOGY, THE DEPARTMENTS OF COMMERCE, STATE, DEFENSE, AND THE INTELLIGENCE COMMUNITY ARE WORKING IN CLOSE COOPERATION TO MONITOR EVENTS IN BIOTECHNOLOGY RESEARCH. THE COMMERCE DEPARTMENT IS NOW IN THE PROCESS OF ESTABLISHING A BIOTECHNOLOGY TECHNICAL ADVISORY COMMITTEE (TAC), COMPOSED OF REPRESENTATIVES OF BIOTECHNOLOGY, PHARMACEUTICAL AND SCIENTIFIC EQUIPMENT FIRMS, TO ADVISE US ON EXPORT CONTROLS IN THIS AREA.

THE OFFICE OF EXPORT ADMINISTRATION DOES NOT CONTROL BASIC SCIENCE OR RESEARCH, NOR DO WE INTEND TO. BUT, WHERE THE EXPORT OF THE PRODUCTS OF BIOTECHNOLOGICAL RESEARCH COULD ADVERSELY AFFECT OUR NATIONAL INTERESTS, THE NEED EXPORT CONTROLS WILL BE CAREFULLY CONSIDERED. WE WILL BE IN A MUCH BETTER POSITION TO PREVENT EXPORTS DETRIMENTAL TO OUR NATIONAL INTERESTS IF WE ARE WELL-INFORMED OF THE USES AND APPLICATIONS OF BASIC BIOTECHNOLOGY RESEARCH AS THEY DEVELOP.

The CHAIRMAN. All right. Fine. Thank you very much.

We would like to welcome Vince DeCain from the Commerce Department, who is an expert on export control questions, and Amoretta Hoeber, who is Deputy Assistant Secretary of the Army and a chemical warfare specialist.

Ambassador Adelman, I will put the questions to you, and then you can defer to any of the panelists for detailed answers on them.

I would like to ask you first about Iraq's chemical weapon program. What can you tell us about that program in open session?

How long has it been under development? What is its apparent purpose?

Ambassador ADELMAN. Mr. Chairman, I, unfortunately, cannot tell you a great deal in open session. Let me say that the important part of that is Iraq's indigenous capability to manufacture weapons in violation of treaty obligations it has undertaken and to use those weapons in combat, obviously against Iran.

This is a frightening development because, as Mr. Feith said so well, chemical weapons around the world are not difficult to manufacture, the parts are not difficult to obtain from different places, and the military utility of these weapons is quite high. They scare the daylights out of the other side and immobilize it in the ways that Doug Feith described.

So the important point is, in Iraq the capability is indigenous, and it has been effective.

The CHAIRMAN. Could you describe the extent of the danger that chemical weapons facilities or weapons stockpiles of Iraq pose to countries other than Iran? How much of a threat are they to Israel? How much of a threat to ourselves if these so-called nightmare weapons happen to get into the hands of terrorists like Black June which Iraq supported?

Ambassador ADELMAN. There is a danger that chemical weapons of high or medium toxicity may fall into the wrong hands. The threat also depends on the availability of delivery systems and other means of utilizing these weapons against Israel. The dangers posed by those weapons are quite severe, and we would fear that in more and more engagements between Iran and Iraq now and in the talked-of "final offensive" coming along, Iraq would be prepared for more extensive use of chemical weapons than it has been in the past.

The CHAIRMAN. It has been noted that there are approximately 15 countries with the capability to manufacture and use chemical weapons. I realize that you cannot probably name these countries, but can you tell us anything about what kinds of countries are up to this kind of activity and this kind of manufacture?

Are they the same ones we fear may be developing nuclear weapons capability, for instance? Are they heavily concentrated in any particular part of the world? Are they wealthy, technologically advanced nations, or are there nations on the other side of the spectrum? Can you tell us something about the list?

Ambassador ADELMAN. Yes. Mr. Chairman, you are absolutely right. At least 15 countries have a chemical weapons capability. I think they would fall into three categories. There are a number of Western countries; the Soviet Union has an extensive chemical

weapons capability that I am sure you are aware of, but it is staggering in terms of the capability in Central Europe; and third, problem areas around the world such as Iran and Iraq.

I think you could fairly say that those problem areas are more concentrated in the Middle East than they are spread around the globe. This would naturally fit with other kinds of proliferation dangers, because there is so much danger so often of conflict in the Middle East.

The CHAIRMAN. What you have said today and what for security reasons you have been unable to say has very disturbing implications. We all know that any proliferation of nuclear weapons threatens humanity. Now we are learning that for other, less costly, easier-to-make weapons, far less sophistication is required, although they may pose a threat approaching the horror of nuclear war and nuclear arms. That is why some are calling chemical and biological weapons the poor man's atomic bomb.

Could I ask you just how hard is it and how long does it take to make chemical weapons?

Ambassador ADELMAN. I would say, Mr. Chairman, that you are right on key. I said in my prepared statement that chemical weapons are the poor state's weapon of mass destruction and the poor man's weapon of mass suffering.

Attention has been focused on the nuclear issue for a number of years, and that is understandable. But when I look to the remainder of this century and what kind of threats there are to security around the world, I personally put the threat of a nuclear war low, very low. I personally put the increasing use of chemical weapons around the world high.

This is disturbing, and we may be in a situation, Mr. Chairman, in future years to look back and say it was understandable that we concentrated on the nuclear issue in the 1960's, 1970's, and 1980's, but we just did not concentrate enough on the chemical issue and nip in the bud the idea that when countries go to war with each other, in the Third World especially, the use of chemical weapons is just a normal kind of endeavor by the 1990's or the next century. That is what this administration is really trying to do; that is what the effort to totally eliminate chemical weapons through the draft treaty exercise in Geneva is all about.

The CHAIRMAN. Can you give us some evaluation as to the deadly nature of chemical weapons? For instance, how big a dose of nerve gas is necessary to kill people?

Ambassador ADELMAN. Amoretta.

Ms. HOEBER. Very small doses are all that are necessary to kill people. You talk about milligrams per kilogram of body weight. The amount that will fit on the head of a pin of the most toxic nerve gases will kill a human being.

The CHAIRMAN. Thank you.

In your comments, Ambassador Adelman, you mentioned the Nuclear Non-Proliferation Act. Do you feel that we need, for international norms, a chemical nonproliferation act?

Ambassador ADELMAN. Well, I think that the best kind of act we could have is a treaty that was not only agreed to but respected and complied with by all countries around the world to eliminate these weapons altogether. I think beyond that top priority of ours

and No. 1 request, the No. 2 request would be for greater cooperation among countries, especially in the West, who have chemical weapons or have chemical industries in order to share exports controls—that has been very effective, and the Commerce Department did a super job on this last March—and to also share information.

I think about this problem of chemical weapons as lying somewhere between the nuclear issue and the terrorist issue. With respect to the nuclear issue, it is rather difficult for countries to clandestinely have nuclear power plants or other plants capable of producing nuclear materials, so that you generally know where the nuclear sites are in a country. In addition, generally you can have a handle on exports to those nuclear plants, because nuclear supplies are pretty distinctive.

In terms of terrorism on the other side of the scale, anybody can get a gun in almost any country in the world. What you have to do in terms of international cooperation is not so much export control but sharing intelligence, and sharing anticipation of events, and sharing procedures on how to react to a terrorist situation.

I think of chemicals as somewhere in between the two extremes. There can be some export controls. There can be consultations and intelligence sharing, and anticipation of the kind of problems that we could have in the future and how to deal with them.

Mr. FEITH. Mr. Chairman, if I could add a point on the threat of terrorists obtaining chemical weapons. Chemical weapons have been around for a long time, and terrorists have long had the opportunity to resort to them. One of the problems that has occurred of late that makes the threat of terrorist use of chemical weapons greater is the problem of their use becoming fashionable. There's a peculiar kind of fashion in these types of heinous acts, as we saw with hijacking in the 1970's

The fear that many of us have is that the use of chemical weapons in Laos, Kampuchea, Afghanistan, and now by Iraq in the Iran-Iraq war, threatens a breakdown of the international constraints that have kept chemical weapons use from becoming more widespread than it is. And part of the cause of that breaking down of constraints is the unwillingness of the international community to respond with sufficient vigor to the use that has occurred. While we are deeply interested in pursuing a comprehensive chemical weapons ban in Geneva, I think it is extremely important that we pay more attention to the integrity of the chemical and biological warfare treaties already on the books.

The CHAIRMAN. Senator Pressler, it was my hope that you might be able to take over the chair at 5 minutes to 11 so I can go present these treaties, and then we will have a vote on those, and we can be back here by 11:30.

Do you have a conflict that would prevent your doing that?

Senator PRESSLER. Yes, I do. I did not know that was your intention. I cannot do that.

The CHAIRMAN. I am sorry. I understand you have a question. Then why do you not put it, and we will try to locate another Senator that can chair the hearings while I am gone.

Senator PRESSLER. I will just ask a couple of questions here.

The CHAIRMAN. OK.

Senator PRESSLER. As you know, we authored, with Senator Percy and others, Senate Resolution 201, which expresses the Senator's concern about the Soviet use and/or provisions of yellow rain. Senate Resolution 201 was approved unanimously by the Senate after two hearings that we held. At one of those hearings, the State Department testified that it was the determination of the United States Government that yellow rain was being used in Afghanistan and Southeast Asia. Since that time, I have seen several articles and editorials questioning that conclusion and reports now indicate decreased use of yellow rain in Southeast Asia.

Do you still think that that statement by the State Department, and it probably was run through your office, that the Soviets have used or provided yellow rain in Southeast Asia and Afghanistan stands in light of some of the journalistic questioning of it?

Ambassador ADELMAN. I think it is certain that the Soviets have used illegal chemical weapons in Afghanistan. The expression "yellow rain" is not one of scientific derivation. It is more a popular term. It has been used popularly to mean the mycotoxins that have been found in Southeast Asia. In another sense it has been popularly used to mean illegal chemicals of very high potency.

The important point is that the chemicals used in Afghanistan were illegal and very severe.

Senator PRESSLER. And have you seen some of these recent articles that question the validity of the evidence?

Ambassador ADELMAN. Yes.

Senator PRESSLER. And you disagree with them obviously.

Ambassador ADELMAN. Yes. I think that it is clear that any time that you have a report on any phenomenon, especially one in Southeast Asia or Afghanistan where we do not have lots of television cameras and lots of free press and lots of congressional inspections and international inspections, et cetera, you are going to have bits of evidence that you can have doubts about.

I think the important thing to look at in the chemical weapons reports is the whole spectrum of evidence, the whole pattern. The pattern in Southeast Asia is that we received refugee reports starting in 1975 and 1976. This was disturbing. When I got up to the United Nations in 1981, the Carter administration had done a very good job in laying the groundwork for a U.N. inspection of the situation in Southeast Asia because of the evidence that they had not only from the refugee reports, but also from intelligence sources, photographs, and medical reports. So you have a whole variety of material there.

Since that time, as you know, Senator Pressler, the U.N. has tried to send a team to the countries where this has been going on. The countries themselves kept the U.N. team out of the area so that they could not see it, and the U.N. has been hobbled in its effort as a result.

I think that those skeptical articles are done with the best of intention, but they do not look at the whole picture. They take one microscopic piece of evidence and examine it hard rather than assess whether all the evidence fits a pattern.

Senator PRESSLER. Does DOD agree with that?

Mr. FEITH. Yes, Senator. We think the evidence is very strong, and some of the doubts that have been cast on it have ignored ex-

actly the insight that Mr. Adelman has stated: that the case is a reflection of many different types of evidence. It is always easy to take a thin slice of the total body of evidence and say that it does not prove the case, but the United States Government is not saying that any one thin slice proves the case.

Senator PRESSLER. OK. I believe Richard Burt gave that statement up here before the subcommittee that I chaired. Does that statement still stand?

Mr. FEITH. Yes, absolutely.

Senator PRESSLER. OK. Great.

Turning to another subject, it has sometimes been said that the various offers for arms control agreements are like somebody walking into a room and saying if everybody in this room will give $1 million to charity, I will give $1 million, of course, knowing that everybody will not. Nobody gives anything, and nothing happens.

Now, the U.S. draft chemical weapons treaty that Vice President Bush presented in Geneva, provides for anywhere, any time, onsite inspection. Some of our own people have privately told me of our chemical industry's fear of compromising their proprietary technology if we really agreed to this provision.

Are we sure the Soviets would agree to this? Is that analogous to the million dollar charity offer?

Ambassador ADELMAN. I do not think so, Senator Pressler. I think that it is analogous to saying that we have a very difficult problem here: (a) the increasing use of chemical weapons; (b) we want to address it in a total ban by treaty; (c) verification is very important in this regard. Why is that? Because a ban that is followed by one side and not by the other is not arms control at all. It is unilateral disarmament in the guise of an international accord.

We want to look at this situation in terms of how best to deal with the problem in a way that gives us assurance that a ban is complied with.

Now, the only way we have found that could help us in this regard is the kind of inspection provision that is in article 10 of the draft treaty. I think you are absolutely on key, Senator Pressler, in saying it is a very inconvenient provision, and it is a very difficult provision for us.

The President decided that we would put up with that difficulty for the military, for our intelligence, for the industry. We would put up with that for the benefit of banning chemical weapons; that the gain was worth the inconvenience and the hardship.

Now, I think that the Soviets can and should deal reasonably with this treaty. I think that it is a question not so much of whether the Soviets would or would not agree to article 10. I think the question is whether the Soviets want to ban chemical weapons. If the political will is there and the intensity of feeling is there on their side as it is on our side, then I think that ways can be found to proceed.

Senator PRESSLER. But is that not an almost unattainable standard of verification, any place, any time?

Ambassador ADELMAN. No. I think it is an unprecedented standard. I think it is a difficult standard.

Senator PRESSLER. And you think we offered it sincerely. What would the reaction of some of our chemical companies be to this level of intrusiveness on their proprietary activities?

Ambassador ADELMAN. We have consulted with the chemical companies since this whole process began in 1977. We have informed them of steps from 1977 to 1980 and then again over the last few years on this. And they were understanding of the problems involved. Let me say that they were more understanding than I would have expected, I suspect for a very understandable reason: they are involved in a profession, in a fulfillment of human needs that has helped our lives a great deal. Look at what chemicals have given us over the years.

They do not want a situation where the whole industry is given a black eye because of the use of chemical weapons. So they have an interest in stopping this practice and stopping any possibility that their good profession and good name is tarnished.

Senator PRESSLER. Have you gotten an indepth response from the Russians on that point?

Ambassador ADELMAN. We have not received an indepth response from the Russians. We have received a knee-jerk reaction from the Russians saying that the whole enterprise of our tabling the treaty in Geneva, was a lot of noise.

Senator PRESSLER: OK.

Ambassador ADELMAN. They dismissed it before they even read it. They also dismissed the article 10 provision on verification as being too harsh before they even commented to us or understood its provisions. I think they were just in a pattern of, when the United States presented something, knocking it right away and not getting into serious discussions.

We hope to do that, and are planning to do that, and have invited them to do that for the summer session of the Geneva talks which are going on right now.

Senator PRESSLER. My final question, then, is what is going to happen next, if anything? Vice President Bush has made the U.S. proposal. They have rejected it. Are we just deadlocked?

Ambassador ADELMAN. No, I would not be that dismal about it at all, Senator. I would say that what happens next is that the multilateral forum of the 40 countries in the Conference on Disarmament will discuss provision-by-provision that treaty. Meanwhile, the United States and the Soviet Union will have discussions on the same treaty to try to advance the multilateral effort. I do not take their statements in Pravda as a refusal to work on this project at all.

Senator PRESSLER. Mr. Chairman, I can stay until about 11:10—my staff has sent me a message—if that will help you out any. Does that help, if I stay?

The CHAIRMAN. You can stay until when?

Senator PRESSLER. 11:10.

The CHAIRMAN. 11:10. That would be fine. That would enable you to call the next panel then. I am afraid, however, they can start their testimony, and then you will have to adjourn them. That would give us—I would be back by 11:30 then to continue, and we will have to recess then when Senator Pressler must leave until I get back. But I think we can finish up this first panel.

Just one question on biological weapons. We did have the anthrax breakout in the Soviet Union. Can you bring us up to date on what we have done? We filed a demarche with them. We asked for a full explanation. We asked for inspection. Where do we stand on that?

Ambassador ADELMAN. Yes. We have brought it to the attention of the Soviet Union a number of times, and I think it is fair to say that you have been very essential in this endeavor as well, Mr. Chairman. We have gotten the same kind of response from the Soviet Union, that it was a breakout of bad meat, some natural phenomenon. To be quite honest with you, without letting them off the hook, I would be extremely surprised if we got any further and more honest word from them.

The CHAIRMAN. Maybe I could just sum up my own questioning, Ambassador Adelman.

After India's first nuclear blast in 1974, we and our allies sat down and tried to figure out just what we could do to control the technology for making nuclear bombs. It has been a complicated and prolonged task. I am convinced we have made some success in slowing the spread of nuclear arms.

I just do not think we have anywhere near the level of knowledge about chemical or biological weapons and their technologies. I understand the Commerce Department does not even have a technical advisory board for the chemical industry. I understand that the Commerce Department has so far resisted requests from the National Institutes of Health to impose export controls for dangerous biological substances. Maybe we need some new laws on the books also.

Let us suppose we catch a band of terrorists somewhere in the United States with several gallons of nerve gas. Unless I am mistaken, the unauthorized possession of chemical or biological weapons is not today a crime in the United States. We have laws like this for nuclear weapons. Do you not think we have the same need for chemical and biological weapons?

Ambassador ADELMAN. Let me address that if I could, Senator. I think that what we need are procedures to deal with chemical weapons that are a lot better than we have had in the past. We need intelligence sharing, export controls, and experts in the State Department, ACDA, Commerce, and Defense who have a good knowledge of this chemical weapons field.

Whether you need new laws anytime soon or new procedures is an open question at this point. And to reiterate what I said before, I put it somewhere between the nonproliferation side of the spectrum and the terrorism side of the spectrum where it would be difficult to think of specific kinds of——

The CHAIRMAN. Would you give our committee a commitment that you would look into the question of export controls of chemical and biological weapons?

Ambassador ADELMAN. Yes.

The CHAIRMAN. I would like to give the Commerce Department a chance to respond to that. I will read it very carefully when I come back.

I will have to go to the floor because floor does take precedence over committee, and we must begin at 11 o'clock on these 18 treaties.

Senator Pressler has indicated he would be happy to carry on until 11:10, and then, Senator Biden, I wonder if you could call the next panel, and I would be back here at 11:30 from the floor.

Would you be able to do that?

Senator BIDEN. OK. I have a Judiciary Exec I am supposed to be at, but we will work something out.

The CHAIRMAN. All right. Fine. Thank you very much.

Senator PRESSLER. Mr. Chairman, I have just a few more questions for the witnesses.

The CHAIRMAN. Fine. You go right ahead. You are in the chair now. Thank you.

I want to thank the panel very much.

Ambassador ADELMAN. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

Senator PRESSLER [presiding]. Have we covered the Iraqis' use of yellow rain or the Iraqis' use of weapons? Some have claimed that the Iraqis are using yellow rain. What do you say to those statements?

Ambassador ADELMAN. The evidence is that the Iraqis are using chemicals. Whether they are in that yellow rain category, I have read reports—there is a scientist named Heyndricks in Belgium who alleged that. I do not believe we have confirmation of that, and my personal opinion is that they are different kinds of chemicals and different substances from the mycotoxins that are used in Southeast Asia.

Senator PRESSLER. One thing that intrigues me is why do we bother with nuclear weapons when I am told that you can take a small amount of gas and get it into the center of a city, mix it or whatever, and release it and have the same effect? And that such gas could be moved very clandestinely, and so forth. It seems as though these weapons are as much a threat to our cities as nuclear weapons.

Is that a safe assumption? I am told that you could very easily smuggle them into almost any city. It just takes such small amounts of basic chemical compounds to make the gas.

Ambassador ADELMAN. Let me say, Senator Pressler, that the point I was trying to make and Doug Feith was trying to make before is that we have to deal with both situations; that all too often in the past the nuclear issue has so overshadowed as to drive out concerns on chemical weapons. And I think that they both constitute a threat, and I think they both have to be dealt with.

Let me also say that I was engaged in a very fascinating exercise over the last few months of reading strategic literature from the 1920's and 1930's about the future. When you read this literature, you find that the fear of wiping out civilization through chemical weapons is very similar to the whole discussion on nuclear winter and climatic changes and wiping out the world directly or indirectly with nuclear weapons today.

After this literature in the 1920's and 1930's about Armageddon by chemical weapons if the world should ever have a war once

again, the one thing that was not used in World War II was chemical weapons.

Senator PRESSLER. Because each side was so frightened of retaliation?

Ambassador ADELMAN. That may be. And certainly it is fair to say that the Nazis did not have any great moral reservations about the use of chemical weapons. They were busy using gas exterminating Jews at the same time. They certainly did not have any moral hesitation over any of their pursuits. But yet, the decision was made by Hitler himself not to use chemical weapons because of the knowledge they had—and what we know about German historical records in the archives now, they way overestimated in German intelligence the amount of chemical weapons in the hands of the British and the French. The British and the French and the United States overestimated what the Germans could do as well.

But anyway, there was a decision by both sides not to be the first to use chemical weapons, and so there was no initiation of that.

Now, I think that there is a lesson in there that applies both to the chemical field and to the nuclear field, that the kind of prohibition—the moral and international standard—that existed even at that time is really in danger of breaking down today.

Senator PRESSLER. Yes. I recently heard that the Germans could have easily stopped the invasion of Normandy with chemical weapons. They could have stopped our forces with what they had, but they did not, I guess for fear of retaliation.

Well, finally, following that up, what about the Iraqis ultimately providing chemical agents to PLO terrorists?

Ambassador ADELMAN. That is always a danger. When you have some kind of dastardly weapon, nightmare weapon the chairman calls it, in hands as irresponsible as those of Iraq, Iran, and other countries around the world, the handoff of this equipment to terrorist groups is a frightening prospect.

Senator PRESSLER. My last question is for both DOD and you to comment. Do you fear that chemical agents might be used in the Middle East and Persian Gulf against U.S. forces? I would also ask for DOD's response to my previous question on the possibility of Iraq supplying chemical agents to PLO terrorists. Moreover, I ask if PLO terrorists presently possess any chemical weapons.

Mr. FEITH. Our intelligence community has no information that would establish whether the PLO has chemical weapons. I would point out that the chemical weapons threat against any country in the Middle East or any place else is greatest when that country does not have the ability to retaliate in kind. Those countries that do not have that ability are even more inviting targets of chemical attacks than the others. This relates to the point that Mr. Adelman made about the nonuse in World War II.

It is noteworthy that the historical record is fairly clear that those countries that can retaliate in kind are in a position to deter, to prevent chemical weapons use against themselves.

Ms. HOEBER. I can expand, if you wish, on some of the problems that you raised of the potential use of chemicals against U.S. forces in that sort of an environment. It would greatly increase our defensive problems. In the first place, the defensive equipment, which is quite good, imposes a great deal of heat stress. And if you talk

about operating that sort of equipment in a warm climate rather than in the colder climate of Europe for which it was originally designed, you are going to impose a lot of stress on our people. We are talking about 50 percent degradation of individual performance. That is like cutting the number of our troops in half.

Senator PRESSLER. You mean like wearing a gas mask?

Ms. HOEBER. Wearing a gas mask and a protective suit and the hood and gloves that go with it.

Senator PRESSLER. Like wearing it in August in Washington.

Ms. HOEBER. Like wearing it in August in Washington. The normal weight loss of wearing that sort of stuff for about 8 hours is 17 pounds.

Senator PRESSLER. Boy, they ought to get that into diet books.

Ms. HOEBER. Well, it is not too bad. I have tried it myself.

But we have other problems that relate to the Mideast environment. That is a contingency area for things like army troops. That means we do not have stores stockpiled there. We do not have protective equipment or ammunition very heavily stockpiled forward. So everything needs to be moved by air.

The chemical protective gear, while not particularly heavy when you compare it to tanks or armored personnel carriers, will use up a lot of bulk in the air transport. We have very little air transport today anyhow. The space and weight is really at a premium. And to have to add a resupply of chemical protective gear to that would create additional problems.

It is an area where there is a very little water indigenous to the environment. Most of our decontamination capability is based on the use of water. You mix water with particular decontaminant solutions or particular powders depending on what you are trying to clean up and what sort of agent you are trying to clean it from. Without large supplies of water, the contaminants will stay on the equipment, stay on the protective gear much longer, and therefore, people will have to operate in the protective garments almost on a permanent basis, with all the degradation that imposes.

So a lot of problems would be created just because of the different environment and the different configuration of U.S. forces in any Third World area, but most particularly in warm climate areas.

Senator PRESSLER. Thank you.

I am going to turn this over now to my colleague from Delaware, Senator Biden.

Senator BIDEN [presiding]. Thank you very much.

I am told that the U.S. Government has controls on 37 precursor compounds for chemical weapons, and has recently specifically prohibited the export of five chemicals to Iran or Iraq. My question is, how cooperative has U.S. industry been in helping to make these controls effective?

Mr. DECAIN. Very cooperative, Senator. Part of the process involved in arriving at the decision to control these items involves consultation with industry. There was no resistance from industry. In fact, there was general approval of the actions that we were about to take, and therefore moved not only with their concurrence but their endorsement as well.

Senator BIDEN. What would it mean if the United States had to enforce the draft treaty's provision of "anywhere, any time" inspection provisions in U.S. industrial facilities? Has the administration talked with the chemical industry about that?

Ambassador ADELMAN. We have talked to the chemical industries about this. What it would mean is, as I said to Senator Pressler a few minutes ago, a tremendous inconvenience and disruption for them. The President was well aware of that with the industry, with the military, with intelligence, and decided that it was worth the kind of tremendous inconvenience and unprecedented nature in our own country to get a ban on chemical weapons worldwide that would be effective.

It was not explained to him, nor did he understand it, that it was going to be a nice, convenient kind of procedure for us.

Senator BIDEN. I was not suggesting otherwise, but I wonder, from the Commerce witness, what the industry has said. I think the administration is right, but what I want to know is, what did the industry say?

Mr. DECAIN. We have not been involved in the process that Mr. Adelman has described for you, but I assume that we will become part of the process shortly when it becomes appropriate. As of this stage, however, we have had no contact on that proposed treaty.

Senator BIDEN. Has any portion of the administration been in direct contact on any broad basis with the chemical industry on this?

Ambassador ADELMAN. Sure. We have kept them informed and consulted them constantly during the chemical weapons treaty drafting process. Their reaction, as I explained to Senator Pressler a few minutes ago, is that they are determined to help stop the spread of chemical weapons. As you understand, this gives the whole industry a black eye in terms of reputation and public standing, not only in the United States, but internationally.

We have explained to them the kind of procedures on verification and they recognize that they would be very onerous procedures. We explained that they would be. The question anybody has to face is the question that you have answered in the affirmative, as did the President, which is, is it worth the bother? Is it worth the inconvenience? Is it worth the pain?

Senator BIDEN. I guess I am not reading you well enough. Is the answer that they basically say that we do not like it but we will do it?

Ambassador ADELMAN. I do not know if it has been that clear. It has been clear that it would be very inconvenient. Of course, when you work with any industry, you hear a lot of voices. We have not been overwhelmed by opposition to that at all.

Senator BIDEN. Mr. Feith, do you have a comment?

Mr. FEITH. Senator Biden, one of the more interesting remarks that I have heard from the chemical industry is the observation that they are so heavily regulated from 50 different angles, with inspectors walking around their plants from EPA, OSHA, and a number of other agencies that being subject to the extraordinary measure of a special inspection under an international chemical weapons treaty strikes them as a marginal contribution to the general problem they have in dealing with the U.S. Government.

Senator BIDEN. They have not expressed a concern to you, then, about compromising the proprietary technology in this?

Ambassador ADELMAN. Well, we would have techniques to work with them so that there would not be that kind of problem.

Senator BIDEN. I know what we would do, and what we say. I am trying to get what they are saying.

Ambassador ADELMAN. I would have to give you the industry representatives' position on that, and to make it more specific than I know about at this time, I will be happy to supply that for the record.

[The information referred to follows:]

POSITION OF THE U.S. CHEMICAL INDUSTRY REGARDING THE DRAFT TREATY TO BAN CHEMICAL WEAPONS

We have consulted with the Chemical Manufacturers Association (CMA) since 1977 on chemical weapons activities in the Conference on Disarmament.

On April 18, the day the Vice President presented our draft treaty in Geneva, the CMA was briefed during its monthly meeting and provided with copies of the draft treaty and a special paper prepared by ACDA on the possible impact of the treaty on the U.S. chemical industry. Comments were invited and plans made for an ACDA representative to attend the May meeting to follow-up.

At the May 24 meeting the CMA and ACDA representative presented an oral summary of the draft convention and the chemical weapons negotiations. We emphasized our interest in consulting closely with the chemical industry as the process unfolds.

There were few comments; the overall, general reaction from the CMA representatives was positive and cooperative. The CMA has not specifically endorsed the on-site inspection provisions of the CW draft treaty, but has been very supportive. CMA has neither opposed the intrusiveness, nor indicated that it saw any insurmountable problems regarding proprietary information assuming it is involved in the development of inspection procedures. The CMA representatives requested that the U.S. Government work closely with the Association in developing inspection procedures for treaty verification. They were assured that this would be done.

Senator BIDEN. You seem to know about their concern about inspectors, so maybe, sir, they have communicated to you their concern a little more than they have to Mr. Adelman.

Mr. FEITH. The question of proprietary information has come up, but there are special procedures that we have built into the special inspection provision that are designed to minimize the industry's exposure.

Senator BIDEN. And do they say, well, yes, that is right, they do minimize it? What are they saying to you? That is what I am trying to get at.

Ambassador ADELMAN. It is not very definite. It has not been very precise so far. What they are doing is looking at it, considering it, weighing it, and trying to find out how this would work, how that would work. I think that is a fair answer to give you.

Senator BIDEN. Is the administration prepared to resume bilateral talks with the Russians on banning chemical weapons as the so-called Cohen-Biden resolution with 41 cosponsors urges?

Ambassador ADELMAN. Yes.

Senator BIDEN. You are prepared to do that. Have you made an offer to bilaterally negotiate with them?

Ambassador ADELMAN. Yes.

Senator BIDEN. What has their response been?

Ambassador ADELMAN. Their response has been, they would like to work with us on the chemical weapons situation in Geneva on the margins of the CD, is the way we have envisioned it.

Senator BIDEN. Has there been an agenda proposed or a time of beginning these bilateral talks?

Ambassador ADELMAN. That I would be happy to answer to you, but not in open session. I would be happy to talk to you right after this hearing about that.

Senator BIDEN. I have a number of other questions, but I am told, and you know, let me say that this feels like the good old days when I used to be able to chair these hearings.

Ambassador ADELMAN. Is this not similar to when you started off on the African Subcommitee?

Senator BIDEN. Sure, and it was also similar to when I was head of the European Affairs Subcommittee, and things were going well in Europe.

Ambassador ADELMAN. Do you want us to change that? [General laughter.]

Senator BIDEN. Since we are going to vote at 11:30, and I guess the vote has started now, in any case, let me say that it has been nice talking to you gentlemen, and you, madam. Keep wearing that chemical warfare rubber sweatsuit. It probably looks good on you. [General laughter.]

I will bring the next panel forward to the witness table. Our next panel will consist of Ambassador Charles Flowerree, former U.S. Representative to the Committee on Disarmament, and Mr. Brad Roberts, Georgetown University Center for Strategic and International Studies.

[Pause.]

Senator BIDEN. Gentlemen, let us begin in the following way, with your permission. A vote has been sounded here. It is one of those typical Washington constructs that we have here. One vote counts as 16, so it is one of those things where, as much as I like you two fellows, I have no intention of missing that vote. The vote will be finished at 11:30, which means we have 12 minutes.

As I understand it, the chairman is coming back at 11:30 or shortly before. What I would like to be presumptuous enough to suggest that we do is either totally withhold your statement and wait until the chairman comes back to deliver it. I want to ask you some questions, because if you give your statement I am not going to get to ask you any questions in the next 12 minutes.

Let me say that you will have an opportunity to fully give your statements with the chairman and/or me back here after 11:30, or at a minimum it will be put into the record. But I do think you will be able to read your statements to the chairman and other Senators who should return.

So what I would like to do, if I could, is ask you a couple of very direct questions in the few moments that I have.

Ambassador Flowerree, how do you assess the current prospects to reach an effective chemical weapons accord?

STATEMENT OF AMBASSADOR CHARLES FLOWERREE, FORMER U.S. REPRESENTATIVE TO THE COMMITTEE ON DISARMAMENT, RECTORTOWN, VA

Ambassador FLOWERREE. Senator, I have to say that I do not assess those prospects as being very hopeful in the near future. I think there is a long-term possibility. I see the problems that we had when I was doing the bilateral negotiations with the Soviets, and the problems that have appeared in the multilateral negotiations as being of a very serious political and technological nature. And I think that even with the best will, it would take a matter of certainly many months, if not years, to achieve an agreement.

Senator BIDEN. Mr. Ambassador, do you believe that the U.S. draft treaty provides a basis for reaching an agreement with the Soviet Union, even in the context of what you just described the time frame as being needed?

Ambassador FLOWERREE. Senator, I was planning to make a brief statement which would cover that point, but I would be glad to answer it right here. The multilateral treaty which was tabled in the Committee on Disarmament, is essentially a detailed elaboration of the general approach that we had been following in the past, with a few notable exceptions.

One is the prohibition on use of chemical weapons which was not included in our original approach back in 1977, because at that time we did not want to detract from the authority of the Geneva protocol. There are other reasons, and I think they are probably cogent ones, for including a ban on use now.

The other one which we have discussed here is the mandatory on-site inspection provision, article 10. I think that that one will not only give difficulty to our own industry—I think that subject was danced around a bit just a few minutes ago—but there are other countries besides the Soviet Union which will have difficulty in accepting that kind of provision, anytime, under any circumstances inspection.

Our approach in previous years has been that we would work toward some kind of challenge inspection which would mean that if a party had a suspicion that something contrary to the treaty were being undertaken by a particular treaty party, that they could ask for an investigation; and if the party—the suspected party—refused, then they would have to explain why they were not willing to accept an investigation. And then the other parties to the treaty could draw their own conclusions from that exchange.

I think in the long run, there is more likely to be a kind of approach that would be acceptable than the mandatory provision which is in the treaty now, in the proposed treaty.

Senator BIDEN. You can see, Mr. Ambassador, that our staff likes to be in the dark more than we do.

Ambassador FLOWERREE. You are putting the witnesses in the dark as well.

Senator BIDEN. I kind of like the light, but you can leave the curtain closed. We might as well stay in the dark.

There is a slang expression that we use up here, Mr. Ambassador, in the U.S. Senate when someone has a very nice-sounding amendment—I mean, it just glides off the tongue and it seems like

it makes a lot of sense, and we attach it to a very controversial bill, knowing that in fact if the amendment is ever attached, the bill dies. We call them "killer amendments."

Some have suggested that the "anytime, anywhere" provision that the administration is putting forward is somewhat disingenuous in that they know that it, in fact, will sound the death knell of any agreement and allow them to then wave the bloody shirt, saying,

> We tried; we made our first effort; we went forward as far as we could, but it is obviously those dirty Soviets who won't talk with us anymore, and therefore we can't deal with them.

I do not want you to sign on to any or all of that, but would you consider this a killer amendment, the "anytime, anywhere" provision?

Ambassador FLOWERREE. Senator, having spent a great deal of time on this subject over the past several years, I would like to see our efforts succeed. I do not want to make any predictions about how the negotiating process will proceed on the proposal that we have put before the Committee on Disarmament.

It might very well be that this provision, with some modifications, might be acceptable. If we are prepared to use it as a going-in position and do what is necessary to make the treaty acceptable to the parties that are involved in its negotiation, then I would feel that this is an appropriate approach to make.

I do not want to say that this is a killer amendment.

Senator BIDEN. That is a fair enough statement.

Mr. Chairman, I have one last question, and then I will yield the floor and go vote. This is for Mr. Roberts.

Mr. Roberts, the expression "a poor man's nuclear bomb" is sometimes used with regard, to make an analogy, to chemical weapons. Is that an accurate kind of generalization? I mean, are chemical weapons really a poor man's nuclear bomb? Is it that much easier, is it that much more able to be facilitated than nuclear?

STATEMENT OF BRAD ROBERTS, FELLOW, GEORGETOWN UNIVERSITY CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES, WASHINGTON, DC

Mr. ROBERTS. They can be a poor man's nuclear bomb in certain contexts, depending on precisely how you define chemical weapons. If you think of them as chemical weapons broadly conceived to include toxic and biological organisms, those are truly weapons of mass destruction, and they serve a deterrent function equivalent to that of nuclear weapons.

One can think of situations in which a developing country, faced with an aggressive neighbor with a nuclear capability and unable to produce nuclear weapons of its own, could easily turn to a similar weapon of mass destruction. Chemical weapons could be that in certain situations.

Senator BIDEN. Mr. Chairman, these gentlemen have been extremely gracious in allowing me to ask them my questions before I allowed them to make their statements. So, I think it is obviously

important for the record. They may very well like to give their opening statements or some version of it to you.

The CHAIRMAN [presiding]. That is the intention of the Chair, and I thank you very much.

Senator BIDEN. Thank you very much.

The CHAIRMAN. I would suggest you hurry to the floor. Your vote counts as 16 votes.

Senator BIDEN. Yes, I know.

The CHAIRMAN. Ambassador Flowerree, you do bring us a wealth of experience from your work in chemical weapons and from your experience as former U.S. Representative to the Committee on Disarmament. If you would like to summarize your testimony, your full statement will be included in the record. We will look forward to hearing from you.

Ambassador FLOWERREE. Thank you, Mr. Chairman. It is a pleasure and privilege to be here today.

I regret to say that I did not prepare a statement in advance because I felt that my role here would be to comment in the light of what had been said previously. I did, however, make some notes as the other witnesses were speaking, and I would like to comment on two or three points.

First of all, the multilateral treaty which has been tabled in the Committee on Disarmament is essentially a detailed elaboration of the general approach the United States had been following in the past, with a few exceptions; notably, the prohibition on the use of chemical weapons which we had not included in our original approach on the grounds that the Geneva protocol of 1925 covered the use question and that overlapping with another treaty would detract from the authority of the Geneva protocol.

I think that under the current circumstances and the fact that a large number of countries do wish to see use included in the treaty, that it is now appropriate to include it. And since it will be some time before a treaty is in force, the Geneva protocol of 1925 can serve as the interim prohibition on use.

The other major change from our earlier approach is one that we have just been discussing. It is the mandatory onsite inspection provision under article 10. There are some examples also of substantial elaboration of our earlier approach in this treaty. This would include the provisions for a consultative committee which are given in very great detail in an annex to the proposed treaty, and the provisions for reporting stocks of chemical weapons held by parties at the time the treaty went into effect, and the verification of the statements that are made by parties as they adhere to the treaty.

There is a point that I wish to make—reiterate—about the provision for the mandatory inspection. In the earlier discussion, we talked about the effect of that provision on U.S. industry and on the likelihood of Soviet acceptance of that provision. I would say that there are other countries besides the Soviet Union which would find such a provision rather onerous, and I believe that we will find as we move ahead that it will not be simply the Soviets that will be objecting to the way that that proposal is framed.

I would also like to comment on the question of bilateral negotiations with the Soviets. It is rather interesting that under the

Carter administration we had bilateral negotiations, but the administration opposed multilateral negotiations; that is, the introduction of the subject into the Committee on Disarmament.

The rationale for that was that if we reached agreement with the Soviet Union and then tabled the treaty in the Committee on Disarmament, the major issues would have been solved and we would not have an argument involving 40 nations.

Under the Reagan administration, the reverse situation obtains. We now have a multilateral treaty which has been tabled in Geneva, but up until now there have been no bilaterals. I was, of course, informed a few moments ago by Mr. Adelman that there have been approaches to the Soviet Union about having bilateral discussions in the margins of the meetings in Geneva. I think that is probably an appropriate way to proceed.

There is a resistance in the Committee on Disarmament to treaties that have been precooked by the United States and the Soviet Union and handed to the committee for simply minor modifications.

So if we can proceed to negotiate on the specific points that are at issue between us with the Soviet Union in a serious way, where our negotiators are empowered to reach agreements, then I think that would be all to the good and I would certainly hope that will happen.

There is still another subject that I would like to touch on briefly, and that is the use of chemical weapons. I, like Mr. Adelman, am convinced that use has occurred, but I believe that the United States needs to strengthen its case. I don't believe the Soviets are going to be impressed with our charges unless there is a good body of world opinion behind those charges; that is, the use of weapons by the Vietnamese in Southeast Asia and by the Soviets themselves in Afghanistan.

If it turns out that we are just simply alone or with only one or two other countries in accusing the Soviets of use of chemical weapons in these areas, then I think they would be able to treat these charges as just another shot fired in the cold war, a footnote to history somewhat like the Soviet charges that we used biological weapons in North Korea.

Unfortunately, I believe that the case that we have made has not been convincing to many in friendly and neutral countries, as well as in some circles in this country, and I believe a good deal more effort could be devoted to strengthening the case even now, although the incidences of occurrence are much less, much fewer than they had been in previous years.

At a recent meeting at the University of Ghent, sponsored by Professor Heyndricks, a paper was given by Dr. Schiefer of Canada who, in fact, has been a very strong supporter of the thesis that mycotoxins have been used. But he says that a critical review of the alleged use of CBW agents in Southeast Asia reveals that the events have been poorly documented and insufficient epidemiological data have been collected and presented.

He goes on to say why he thinks that the poor documentation has occurred, but it is significant, I think, that someone of his background is concerned about the fact that we have made the case but left lots of things hanging in the air.

Now, that brings me to a question about the resources that have been devoted to this issue. And I believe that more can be done in the area of detection of new types of weapons. There is great difficulty in detecting a weapon with which we have had no previous experience. At this same conference that I referred to earlier, a paper was presented by a Dr. Stoeppler of the Federal Republic of Germany, saying that it would be a good idea if countries started an environmental specimen bank. That is, they would collect specimens of the environment each year to take into account the new chemicals that were being introduced into the environment, and thus would give a basis for comparing the kinds of evidence that might come in with the background of the environment.

That is an example of a kind of thing that I think the U.S. Government could undertake and could help other countries to undertake.

In summary, then, Mr. Chairman, I agree that the treaty that has been presented in Geneva is basically sound, with the exception of my doubts about the acceptability of the mandatory inspection provision. I believe that we need to make a better case about the use of chemical weapons, and I believe that we need to devote more resources to imaginative ways of detecting and verifying the presence or the use of chemical weapons in various parts of the world.

Thank you, sir.

The CHAIRMAN. Thank you very much, Ambassador. We appreciate your testimony very much. And now our final witness today, Mr. Brad Roberts of the Georgetown Center for Strategic and International Studies. Mr. Roberts was an analyst with the Congressional Research Service, where he coauthored an important report on chemical weapons.

You also may summarize your testimony. Its full text will be included in the record.

Mr. ROBERTS. Thank you, Mr. Chairman.

I am honored to be invited to speak before this committee on the problem of chemical weapons proliferation. Thank you for the opportunity. My purpose this morning is to summarize the nature of the problem and what can be done about it. I would like to summarize my testimony with the following brief points.

First, the prevailing complacency about the chemical weapons proliferation problem is misplaced. We have been slow to perceive that proliferation is in fact occurring. It is a two-step process. First, the means and will to produce chemical weapons must spread, and this seems to be happening widely.

The second step is to actual production and use. This is happening less widely. However, the 15 countries alluded to this morning who now possess a chemical war-fighting capability are about 10 more than we had thought until recently.

Second, the Iraqi use of mustard gas dramatically underscores the ways in which we have misperceived supposed impediments to proliferation, namely, arms control and technical constraints. Iraqi use demonstrates the limits of the existing arms control regime. It is neither comprehensive, universally subscribed to, nor verifiable.

To the extent that it has had much weight, it has depended largely upon three intangibles—confidence that others are not con-

templating such weapons, the political costs that would be borne by states who break with its terms, and moral strictures. None would seem to have constrained the Iraqis, and we must be concerned that these restraints may also be of marginal importance to other Third World countries.

Iraqi use also demonstrates the diminishing significance of technical constraints. Every new petrochemical fertilizer or pesticide plant in the developing world is an investment in a nascent capability, thus eroding constraints on production. In addition, in the simpler battlefields outside Europe, what have generally been taken to be constraints on military utility may not prevail.

In any case, the relevant technology of chemical warfare has evolved in ways that alleviate some of the earlier problems affecting utility. A host of other factors bear on the rate and character of proliferation. It is first and foremost a process based on the incremental decisions of individual defense planners. And the factors affecting their motivations are manifold.

Third, the superpowers set a particularly important model for the Third World. Some will look to the United States to gauge the military utility that we ascribe to such weapons. At the moment, I believe our chemical capability is generally understood to be primarily defensive, NATO specific, and for no-first-use purposes. Massive investments in a new generation of chemical weapons may change this understanding, however.

Soviet capabilities, investments, and actions may have a more pernicious appearance to some developing countries. Extensive Soviet production and export of chemical equipment, massive training of their troops, and an apparent willingness to use or allow their proxies to use such weapons in the Third World must be very distressing indeed to defense planners in developing countries.

Fourth, the instruments of U.S. policy to constrain chemical weapons proliferation are of marginal utility. I would like to assess briefly four such instruments.

First, the United States should maintain a sustained public posture reflecting our moral abhorrence of chemical weapons, their proliferation and use. The moral high ground is an excellent beginning, but it is difficult to see how it will affect the dynamics of proliferation with their roots in the developing world. We must work with the Third World to play a role consonant with its stake in the proliferation process.

To be effective, in short, our diplomacy must be at once aggressive and subtle, outspoken and behind the scenes.

Second, we might seek to create a chemical nonproliferation regime along the lines of the nuclear one. In my view, we should hold little optimism for this. The differences between chemical and nuclear materials, their production, trade, and use are many and substantial. There is, however, considerable utility for improved mechanisms for export control and coordination. This latter ad hoc arrangement will require the prompt detection of chemical misuse and the detection of such misuse should be a high priority for our intelligence agencies.

Third, we might seek to diminish the incentives to proliferation in our bilateral relations with potential proliferants. In our military assistance programs, we might seek to enhance the kinds of

conventional and/or passive chemical defensive systems that would diminish incentives to chemical weapons use by an opponent.

The vulnerability of U.S. forces to chemical attack in the Third World could also be an incentive to proliferation, and we might diminish that vulnerability as well.

Fourth, at the top of our priorities must be the achievement of a meaningful arms control regime, for that is the only means to fully roll back the process. We could have agreement tomorrow were we willing to repeat the hollow triumph of the Biological Weapons Convention of 1972 and acquiesce to Soviet views on compliance and verification. But our security would be ill-served by such a move.

We must be quite realistic, however, about what we can do to influence the outcome of the negotiating group in Geneva. The success of those negotiations hinges primarily on Soviet willingness to come to agreement. We can and are doing two things to influence that willingness.

First, we are seeking to raise the political costs to the Soviets of not negotiating seriously, and we must continue to make skillful use of our diplomacy toward that end. The other is to diminish the military advantage—and hence the overall value—of their chemical warfare capability through our own chemical preparedness program.

Unfortunately, there is profound uncertainty about what motivates the Soviets at the negotiating table, whether increased public pressure of a certain character or the addition of more U.S. bargaining chips helps or hinders. I think it not unreasonable to suggest that Soviet defense and arms control policies really are not readily influenced by our actions in this area, and that we need to know more than we currently do about Soviet intentions in order to assess definitively what we can do to motivate them.

In conclusion, our complacency about the problem of chemical weapons proliferation does not change the fact that it is proceeding apace as nascent capabilities spread, technologies and perceptions change, and the will to use them becomes easier to muster. The dynamics of proliferation have their roots in a changing and developing world, and are only marginally amenable to U.S. influence. Failing the relatively prompt achievement of an effective international legal regime for the control of chemical weapons, the coming years will likely see the further worsening of the situation, perhaps dramatically so.

Thank you, Mr. Chairman.

[Mr. Roberts' prepared statement follows:]

PREPARED STATEMENT OF BRAD ROBERTS

The problem of chemical weapons proliferation grows increasingly urgent, but there is little to suggest that policy makers have begun to appreciate the problem or to think through the options available to us. An improved understanding of these matters is urgent in order to protect our interests and avoid an even more difficult future.

Historically, we have been too complacent about this problem. Today, the proliferation of chemical weapons is proceeding openly (and probably accelerating). We have been slow to recognize it and come to grips with it. It will place new demands on our security and diplomacy, and if the process proceeds much further, we and our allies are likely to face some unpalatable decisions. Unfortunately, the instruments of U.S. policy to check chemical weapons proliferation are not as useful as they once were. But there are some things that we can and must be doing. In these remarks I first sketch out the general parameters and dynamics of the proliferation problem and to assess its severity. Then I will suggest what the United States might do to address the problem.

Chemical weapons were among the first implements of war to be the subject of what we now call arms control, nearly 100 years ago. Though widely used in World War I, they had little effect on its outcome. The Geneva Protocol of 1925 instilled further confidence in the control of such weapons. Chemical weapons were

not used in World War II. The achievement of the Biological Weapons Convention of 1972 inspired even greater confidence, and many felt that its impetus would facilitate conclusion of a Chemical Weapons Convention. In fact, fewer nations today openly admit to possessing chemical weapons than early in this century, though the total number of independent countries has increased. Hence, most policy makers have come to assume that chemical weapons are not particularly useful and that the momentum is in the direction of their complete abandonment.

Today, this assumption must be reexamined. Policy makers must have a precise understanding of why the situation until recently has seemed so stable, what the factors are that hinder or promote proliferation, and how those factors are likely to work today and tomorrow as conditions change. Technical constraints on the proliferation of chemical weapons have been amongst the most significant impediments. Technical constraints are of two kinds - those on the production of chemical weapons and those on their military utility.

The character of these constraints vary greatly with the specific technology embodied in different types of chemical weapons. It is useful to think of four generations of chemical weapons. The first and earliest generation was that in use during World War I, mustard gas being the most familiar of these. Such weapons are, in essence, industrial byproducts, designed for purposes other than warfare but having some limited utility against unprotected troops. The next generation consisted of nerve gases -- chemical agents developed by the Germans during the 1930s from pesticide research -- that kill by disrupting the

body's ability to transmit messages through the nervous system. The generation, developed after World War II, are more accurately described as biological agents. Distinct from artificially produced chemical substances, biological agents are either living organisms that kill through the transmission of disease or the toxins produced by such organisms. This generation of weapons was banned by the Biological Weapons Convention. A fourth generation may be looming ahead - that made possible by bioengineering. We have done no work that I know of on weapons of this kind, though evidence recently cited in the Wall Street Journal and elsewhere suggests that the Soviet Union may have proceeded quite far in this direction.

The equipment and expertise needed to produce the earliest generation of chemical weapons has spread naturally along with the industrial revolution and especially with the petrochemical industry. The reported ability of Iraq to produce mustard gas domestically highlights this worrisome fact. The technology and expertise to produce nerve agents is very similar to that required for the large-scale manufacture of organic chemicals; these capabilities have also become widely dispersed (though less so than those for the first generation weapons) as the international chemical, fertilizer, and insecticide industry has grown. Raw materials for both generations of weapons are traded widely in the international economy, though some of the components required for certain nerve agents are less commonly traded.

Biological weapons probably require a higher degree of

expertise to produce and less readily available components than either of the foregoing generations. Militarily significant quantities of such weapons for many uses are, however, quite small, and it is conceivable that a determined state could put together the requisite components of a biological weapon without great difficulty.

Biotechnology is, of course, the least widespread and least commonly understood of these technologies. We can have relatively high confidence today that the ability to produce such weapons has not proliferated; looking to a possible future in which effective arms control may not have been achieved, we must be less sanguine about preserving this condition.

In sum, the spread of modern industry around the world, particularly the petrochemical, fertilizer, and pharmaceutical industries, has created an essential precondition for the spread of at least two generations of chemical weapons, namely the means and the know-how to produce them.

A similarly disconcerting trend can be discerned with respect to the military utility of these weapons. The common point of reference in understanding the utility for military purposes of chemical weapons is the experience of World War I. In that war, such weapons were unpredictable on the battlefield and often threatened "friendly" troops, delivery systems were crude, persistent agents posed a threat for days after combat use, and effective countermeasures quickly denied the initiator of chemical warfare significant advantage. The legacy of that era remains in the assumption that such weapons are not particularly useful.

Unfortunately, the relevant technology has evolved in ways that make military use of chemical weapons more practical. Battlefield use of chemicals could be more precise today with modern delivery systems, and the former risks of contaminating friendly troops are less today given sophisticated protective ensembles, improved abilities to monitor the movement of contaminants, and heavily armored combat vehicles that can be built to protect those fighting from the inside. Non-persistent agents are now available whose effects last not days but hours or less. In addition, defensive countermeasures, so meaningful in World War I, have somewhat less efficiency today relative to combat performance needs than in that war -- the degradation of combat performance imposed on those forced to fight in protective gear was of marginal importance in World War I, but today its impact ranges from considerable to severe.

In the simpler battlefields outside Europe, much of the understanding of chemical warfare derived from the European context is open to re-examination. Differences in terrain and weather may cause chemical use to be be perceived as more credible and feasible than we are accustomed to thinking. Battlefield predictability also may be less important in many Third World conflicts, where armed forces or neighboring populations may not be so highly concentrated geographically as along the European central front, or where civilian populations may actually be targets. Little or no defensive gear would be available in many Third World conflicts. Chemical weapons could offer decisive advantage in the short, conventional wars which

have been numerous this century, if possessed by one side but not the other. Chemical weapons could have some potential utility in counter insurgency operations. In sufficient quantities and matched by a chemical defensive warfighting capability of some durability, such weapons could also fill a strategic role for some states, especially those with some of the geographical vulnerabilities noted above.

In potential Third World conflicts, chemical weapons might lack some of the drawbacks of using nuclear weapons. Chemicals, for instance, require less sophisticated delivery and C3I (command, control, communications, and intelligence) systems and their use could entail a lower risk of escalation and conflict expansion. In addition, for those in pursuit of a nuclear capability, chemical weapons might be perceived as a temporary half-way house. Chemicals provide some of a nuclear weapon's effects while offering an opportunity to legitimize the deployment and then refinement of delivery, C3I, and defensive systems that, in their crude forms are adequate for chemical warfare but require more sophisication to be credible components of a nuclear capability.

Iraq's battlefield use of chemical weapons may reopen the question of the military utility of chemical weapons in the thinking of military planners in developing countries. Those planners may come to believe that in certain conflict scenarios, such as those in swampy terrain against an ill-equipped but highly-motivated opponent, chemical weapons have some utility. This perception is likely to be reinforced if the Iraqis are perceived to have turned back a massive Iranian assault with

chemical weapons.

In sum, the perceived battlefield utility offered by chemical weapons is a critical factor bearing on the rate and character of proliferation. Historically, this advantage has been unclear or not highly rated. But technology may well be changing this perception for the specific and sometimes unique military needs of defense planners in the developing world.

Technical factors are not the only ones driving the proliferation process, however. Politics, psychology, and law are at least as important as technology, for proliferation is first and foremost a process based on the incremental decisions of individual defense planners in hedging against a spectrum of possible threats. The factors affecting the motivation of decision makers to acquire chemical weapons and the capability to use them are manifold. Some are internal to the state itself, others external.

For example, states better able to realize national ambitions or contend with perceived threats are less likely to pursue a chemical weapons capability than those which believe that regional or global balances work to their disadvantage. Domestic cultural attitudes bear on this process as well.

The perceived stability and justice of the international system may also have an influence. There is little reason, though, to think that the international system is becoming less anarchic or that conflict will become less likely in the future. Indeed, the trends, especially in the developing areas of the world, would seem to be in the opposite direction -- an extensive

international arms trade exists, there is a general trend towards increasing armament, and large numbers of wars have been fought this century. In addition, what few laws of war that exist today derive their strength largely from the threat of reprisal in kind, thus rationalizing weapons stockpiles for deterrence purposes, though these tend to perpetuate the threat they are intended to deter and to stimulate newcomers to adopt the same approach.

Two other factors are particularly critical. One is the international legal regime. The current regime, built upon the Geneva Protocol of 1925 and the Biological Weapons Convention of 1972, has both its benefits and limitations. The regime is an important component of international processes that have worked to hinder proliferation for nearly 100 years. But it is neither comprehensive, universally subscribed to, nor adequately verifiable.

To the extent that this legal regime has had much weight, it has depended largely upon three intangibles. The first is the confidence, however, marginal, that it has inspired in the minds of military planners that their opposites in competing nations are not contemplating such weapons. The second is the political cost that would be borne by states which break with its terms. These political costs would be high for many states, but we are learning that they aren't so high for others, especially those states or regimes struggling for their very survival. The third intangible is morality. The western abhorrence of chemical weapons results from our own experiences of them in World War I. Those who did not share in that experience may not feel our moral

compunction not to use chemical weapons. Speculation in this realm of Third World opinion does not, of course, enjoy substantial grounding in survey research data. A number of people from developing countries have expressed their view that to die by chemical weapons is neither more nor less horrible than to die by bullet or flame and who wonder themselves how Westerners can ascribe selective humaneness to conventional weapons.

The other significant non-technical factors that influence decision makers in this area are the capabilities and intentions of others. The potential aggressiveness of rival states will be weighed critically in an assessment of the chemical weapons option, especially if those rivals themselves seem to be interested in chemical weapons. The general proliferation of nuclear weapons will add a new dimension to these calculations. Those without the requisite technical expertise or financial means for nuclear weapons may search for a "poor man's deterrent", and for some nations this may mean a chemical warfare capability.

Potential threats from two other significant actors, namely the Soviet Union and the United States, tend to influence Third World decisions regarding new weapons. The possession by both states of a chemical weapons arsenal must certainly have a deleterious effect on Third World perceptions.

Some will closely watch the United States to see what military utility we ascribe to such weapons. At the moment, our chemical capability is generally understood to be primarily

defensive, NATO-specific, and for no-first-use purposes. Massive investments in a new generation of chemical weapons may change this understanding, however.

Soviet capabilities, investments, and actions could have a more pernicious appearance to many though perhaps not all developing countries. Extensive Soviet production and export of conventional equipment with a capability to fight in a chemically contaminated environment, the extensive training of their troops for offensive and defensive chemical warfare, a force structure designed to fully exploit chemical capabilities, and an apparent willingness to use or allow their proxies to use such weapons in the Third World must be very distressing indeed to defense planners in developing countries.

In sum, there is a lot to be deeply concerned about. The common assumptions about chemical weapons proliferation do not stand up to scrutiny. Factors affecting the rate and character of that proliferation are dynamic, not static, and the evidence suggests that many of the preconditions for a more chemically proliferated world exist today.

However, few analysts argue that, even with diminishing constraints, chemical weapons are bound to proliferate quickly or extensively. Concern has been tempered by the lessons of the experience of nuclear proliferation, where earlier estimates of the rate proved to be exaggerated or premature. Proliferation must be understood as a two-step process. First, the means and the will to produce must spread, and this seems to be happening widely. The second step is to chemical weapons production and use. This is happening to a lesser extent, though sources

recently cited in the Department of Defense suggest that between 14 and 16 countries are now actively working towards or actually possess a chemical war fighting capability -- in other words, about ten more than we have thought.

We must be distressed by the volatility of the current situation. Proliferation is like a linked chain, and requires some catalytic event or set of events for the process to unfold. Iraqi domestic production and successful battlefield use may be that catalyst, leading to the spread of chemical weapons to its competitors, thence to other neighbors, giving impetus to nascent chemical programs in other parts of the world.

If chemical weapons do proliferate, the world may be a very different place. Developing nations will be subject to an even more horrendous form of warfare, likely to result in massive civilian death and even more massive scarring. The thin firebreak between chemical and biological weapons is probably not strong enough to withstand the strain of chemical proliferation, and we might see a surge in biological weapons production and use, with even more horrendous effects on soldiers, civilians, the dynamics of regional change, and our security interests.

For the states of the West, the implications are equally unpalatable. The pursuit of regional interests will become far more difficult. Vulnerability to coercive diplomacy will increase, especially as states which support terrorism come to have an even more offensive tool at their disposal. A general international arms race in chemical weapons is likely to dash the prospects for the achievement of meaningful arms control, making

it necessary for the West to arm itself with a deterrent capability in ways it has not had to contemplate to date.

What can be done? Less than we might hope, but more than we might fear. The technical, psychological, and legal factors outlined above affecting the rate and character of proliferation are only marginally conducive to U.S. control or even influence. Even with aggressive, sophisticated U.S. policies, the limits are profound. There are nonetheless a number of actions that the U.S. can take that may create some of the preconditions for the solution of the problem.

A meaningful arms control regime would probably solve the proliferation problem, and prompt agreement on a Chemical Weapons Convention is critical. We must be sincere, effective participants in this process. The Administration's activism on this issue and its positive attitude towards the negotiations in Geneva are steps in the right direction. Chemical weapons have long been overlooked as an arena for progress on our broader arms control agenda, and this may be a propitious time to narrow differences between the United States, the Soviet Union, and other participants in the Committee on Disarmament.

The Administration's willingness to take the initiative could send a critical message to those who have grown to expect less of this country. The credibility of the United States on chemical weapons has not been high historically. American prestige was tarnished by the 50 years it took the U.S. to accede to the Geneva Protocol and by the five year delay between the time bilateral talks on chemical weapons were first proposed by President Nixon and the time they actually commenced. The

Soviets skilfully manipulated the secrecy of our bilateral talks during the late 1970s to cast further aspersions upon our credibility. In its earliest days, the Reagan Administration did not improve matters. Its strong commitment to renewed U.S. production of chemical weapons matched by its refusal to return to bilateral negotiations with the Soviets played right into the hands of its critics here and abroad and affirmed their view that the current Administration is not serious about arms control.

In February 1983, the long lull in U.S. activism on this problem was broken with the submission to the Committee on Disarmament by the U.S. of a document spelling out detailed views on the necessary contents of a chemical weapons ban. But that was perceived by most as being primarily palliative in nature, designed to assuage Congressional and European concern about Administration commitment to the arms control goal. In this light, the new proposal takes on a new and special value. We must now negotiate with the same sense of purpose and sincerity that gave rise to this draft treaty.

But wishing an effective arms control regime is not the same as having one, and the outcome of these negotiations does not reside entirely in our hands. Meaningful agreement will not occur without the concurrence of the Soviet Union. We could, of course, have an agreement tomorrow if we so wished, one with great political but little arms control value. Were we willing to acquiesce in the Soviet view on the compliance and verification issues, we could repeat the hollow triumph of the Biological Weapons Convention. But we have learned how

incomplete that treaty is, and how critical those provisions are to enforcing its terms and having confidence in its utility. We must not shrink back from our firm position.

We can, of course, only speculate about the likely future course of Soviet negotiating intentions, whether before or after our Presidential election. Soviet intimations at the time of Chernenko's accession about a willingness to accept certain forms of systematic inspections are heartening, and not inconsistent with some general concessions they have made to our view of this issue. But the optimism this ought instil must not be unbounded. A number of factors raise questions about Soviet commitment to the broader arms control goal. The Soviets have articulated a far clearer interest in containing chemical weapons proliferation than in eliminating such weapons altogether. They have been astute propagandists, with intense focus on temporary, tactical advantage. Their June 1982 proposal to the United Nations Special Session on Disarmament has come to be understood to have been made strictly for propaganda value.

Questions of good will aside, we must also be concerned about Soviet effectiveness as a negotiating partner. Their negotiating team appears unable to receive timely and adequate instructions from Moscow, causing opportunities to be lost. We must also wonder whether in a period of a prolonged succession struggle there is adequate communication between political and military leaders in Moscow providing the impetus to goal-oriented policy.

Though there is not much that we can do to influence Soviet willingness to come to our terms, two options merit further

consideration. One is the skilful use of our diplomacy to raise the political costs to them of failure to negotiate seriously. This was the Reagan Administration's rationale for not returning to the bilateral negotiations after their adjournment in the waning days of the Carter Administration. At that time, progress in the multilateral talks was being hindered by Soviet intransigence in the bilateral talks, though the Soviets were able to exploit the secrecy of the talks to mask that intransigence and in fact to transfer perceptions of it to the U.S. Forcing the Soviets to discuss their views publicly has in fact been something of an embarassment to the Soviets, and their inability to clarify views, their willingness to propagandize and not follow through, and the foolishness of their definitions of some ostensibly significant concessions have served to increase the pressure of the world community on the Soviets.

Since the Soviets are no longer winning the propaganda battle, we should now be willing to meet with the Soviets privately and informally to discretely pursue possible areas of concession, for only in private can concessions be explored without the loss of political face. The Administration's willingness to return to modified bilateral talks is to be commended. However, we must continue such talks only as an adjunct to the multilateral negotiations and must be willing to break off those bilateral talks if the Soviets are not serious about them or attempt to grossly exploit them for propaganda purposes. If the Soviets perceive that they can thus lower the political costs of not negotiating seriously, their incentives to

do so will decrease, thus frustrating our ultimate goal. A long-range view of this delicate process must be taken.

The second means at our disposal to influence Soviet negotiating behavior is to diminish the military advantage, and hence the overall value, of their chemical warfare capability. As you will know, since the late 1970s the U.S. has been devoting increasingly large budgetary resources to efforts to redress deficiencies in the ability of our forces to deter and fight warfare in a chemically contaminated environment. Efforts to improve our defenses and to upgrade our training, doctrine, and force structure are the core of this program. The preservation of our chemical retaliatory capability, the avoidance of unilateral disarmament, is but one aspect of this broader effort. We seek to pose for the Soviets a U.S. capability that is significant and increasingly durable, one that increasingly diminishes the advantages they enjoy from their massive investments in the chemical area.

The most visible of these mechanisms to strengthen our bargaining posture is the production of binary chemical weapons, often proposed in the last two decades by the Army, the Executive, and one or the other bodies of the Congress, but which has not come to pass. The ambivalence of policy makers reflects, I believe, profound uncertainty about the actual utility of binaries as bargaining chips.

On the one hand, the logic is inescapable that an enhanced deterrent along the lines envisioned in the proposed production program would be more threatening to the Soviets in their calculations of potential conflicts that might involve the U.S.

Nor can it be denied that 16 years of non-production have failed to bring effective agreement, and events have not vindicated those who argue that all we must do is give the negotiations one more year and not frighten off the Soviets. The Soviets may in fact be waiting to see whether we will permit our retaliatory capability to wither completely, to unilaterally disarm, and to hand them their primary goal in the negotiations without having to forego a single chemical weapon of their own. If these views are true, binary production could well bring about more serious negotiating behavior on the part of the Soviets.

On the other hand, binary production may further frustrate the negotiations. It may be perceived to vindicate those hardliners in Moscow who argue against arms control. It may confirm the worst suspicions of the non-aligned and neutrals about the U.S. as not serious about arms control, and that the negotiations are merely a cover for a massive rearmament program. Binary production might also come at some cost to other interests, not least of which would be increased friction with our allies, the increased topicality of chemical weapons amongst those in the U.S. and abroad who directly or indirectly influence the perceptions of defense planners in the developing countries, and an increased familiarity with the technology of binary weapons, thus further eroding technical and other constraints on proliferation.

There is a third possibility that I believe to be underrated. And that is that binary production will have little or no effect on Soviet negotiating behavior. It might be

perceived as mere trifling at the fringes. Our existing chemical warfare capability is by no means paltry and, though it is marred by some serious flaws, it cannot be lightly dismissed in Soviet calculations of war with the West. Its utility resides overwelmingly in its defensive components, and these, like those of our allies, are on the rapid mend. A compelling analogy to this third point of view is that since the Cuban missile crisis there has been no correlation between Soviet defense spending and the successes and failures of arms control and detente. This suggests that their defense procurement decisions are not amenable to U.S. manipulation and that, regardless of what we do, the Soviets may well continue to produce chemical weapons at the current high rate. This also suggests that decisions about whether or not to proceed with binary production ought be taken primarily in the context of the requisites of preserving deterrence and only secondarily with the arms control linkage in mind.

Unfortunately, we cannot choose among these three points of view without knowing far more than we do about Soviet intentions. To the extent that we think we know anything, it is filtered through the haze of Soviet propaganda and the biases of its American interpreters of the right and left. I would suggest that a high priority be given to resolving this dilemma.

The achievement of a comprehensive Chemical Weapons Convention would be an essential step towards strengthening the existing arms control regime. But it is not the only necessary step. The once high confidence in the Biological Weapons Convention is eroding, and it has become necessary to add

meaningful verification and compliance provisions to that Convention. None were deemed necessary when it was formulated. The threat was perceived as primarily derivative of the superpower relationship, which was thought to be improving. The U.S. had unilaterally destroyed its biological weapons stocks during the negotiation of the convention, and there was a perception that the Soviets held biological weapons in similarly low esteem.

There is today a move underway in the United Nations to amend the Convention with these provisions. The U.S. should not take the open lead on this issue, however. In the current international climate, we must find a more subtle diplomacy. The nonaligned and others who might favor amendment must not fear that their earnest support for such a move will be coopted by the U.S. in its political and rhetorical competition with the Soviet Union.

A second policy option for dealing with the problem of chemical weapons proliferation is a fallback position if the arms control process fails to provide for prompt and meaningful control -- it is to seek to manage the problem by diminishing the incentives to proliferation instead of seeking to eliminate the problem. This policy could have a number of components. First, the U.S. might redefine its role in the now ongoing modernization of developing world military capability with an eye towards the chemical proliferation problem. In its foreign military assistance programs, the U.S. could enhance the kinds of conventional and/or passive chemical defensive systems that would

diminish incentives to chemical weapons use. As an adjunct to this, the U.S. might coordinate with other arms exporters. The vulnerability of U.S. projection forces must not be an incentive to proliferation, and the U.S. might create a credible deterrent in its own forces for Third World scenarios. An increased defensive capacity to withstand chemical attack might well be adequate in this regard. The deployment of offensive, retaliatory systems could well precipitate the proliferation it would be intended to slow, and should be contemplated only at a time and in a region where proliferation has proceeded quite far.

We might seek to cajole the Soviet Union into becoming an active participant in reducing Third World incentives to proliferation by changes in its political and arm export relations with its clients. It is conceivable that the partial proliferation of chemical weapons will increase Soviet willingness to work with Western nations, as it has in the nuclear domain, to define and pursue common interests.

A third policy option for dealing with the chemical weapons proliferation problem is to strive for the creation of a chemical weapons non-proliferation regime along the lines of the nuclear non-proliferation regime. It would be built upon commitments by states not possessing chemical weapons not to acquire them and by states possessing them to negotiate for their destruction. Compliance would be verified by inspection by an international agency and backed up by agreement of the states able to supply the prerequisite materials, technology, and expertise not to supply certain sensitive produts to problem states. As in the nuclear arena, provisions would exist assuring the inalienable

right for all states to use chemical products for peaceful purposes.

I have neither the technical nor diplomatic experience to fully assess the feasability of this option. But I would not be particularly optimistic. First, the nuclear powers have failed to live up to their commitments under the nuclear non-proliferation regime to negotiate away nuclear weapons, and there would have to be great skepticism in the developing world about their pledge to do the same in the chemical area. Second, the differences between chemical and nuclear materials, their production and use, are many and substantial. The items to be controlled in a chemical regime are quite different from those in a nuclear one -- plutonium and uranium exist in small, relatively easy-to-track quantities, whereas the precursors to chemical weapons are manifold and some are widely traded. However, we could expect a higher degree of efficacy in controlling some of the materials associated with the more advanced generation of chemical weapons. While in theory it may be possible to erect a non-proliferation regime, we must be mindful of the substantial political and financial costs that would have to be paid, and wonder whether they might not be underestimated, as they were in the nuclear domain. In addition, there would always be some residual risk of diversion or other misuse of civil chemical industries, given the relatively low level of technology and the small scale of production required to make militarily significant quantities of chemical weapons.

Short of a formal non-proliferation regime, there is

considerable utility for improved mechanisms for export control and coordination. If a systematic approach is impossible, an ad hoc one may have some utility. We should have the ability to work with other supplier nations to curtail shipments of goods whenever we detect their misuse, and the detection of such misuse should be a high priority of our intelligence agencies.

A fourth step for the United States is the maintenance of a sustained public posture reflecting our abhorrence of chemical weapons, their proliferation, and use. Raising the moral barriers to chemical weapons proliferation as high as possible and keeping them raised is essential. The Senate attention to such barriers is necessary and welcome. We must remind the world of the issues involved, bring approbation on those who use chemical weapons, foster international attention to the proliferation problem, to the negotiations in Geneva, and to Soviet negotiating behavior. We must work with the developed world to play a role consonant with their stakes in the proliferation problem. Only thus can we foster the consensus in Geneva that will raise the costs for the Soviets.

But even with the rhetorical flourish of the Reagan Administration, it is difficult to see how pious remonstrations are going to reinvigorate confidence in the arms control regime and effect the perceptions of Third World military planners about the utility of chemical weapons. The moral high ground is a good beginning, but little more.

In conclusion, the problem of chemical weapons proliferation poses some exceptional challenges to the U.S. The dynamics of the proliferation process have their roots in a changing and

developing world, only marginally amenable to U.S. influence. Failing the relatively prompt achievement of an effective international legal regime for the control of chemical weapons, the coming years will likely see a further erosion in the confidence of that regime and greater incentives to the proliferation of these most abhorrent of man's inventions. The U.S. must exhibit a firm commitment to the arms control process. It must pursue a public diplomacy that is at once aggressive and subtle, outspoken and behind-the-scenes. It must protect its deterrent until arms control is achieved, but it must be mindful of the ways in which its own actions in this regard influence the proliferation problem. Though the instruments of U.S. policy are of limited utility, we are not absolved from doing what we can to influence the way the problem is perceived and dealt with.

[The following letter was subsequently received for the record:]

CENTER FOR STRATEGIC & INTERNATIONAL STUDIES,
GEORGETOWN UNIVERSITY,
Washington, DC, July 17, 1984.

Hon. CHARLES H. PERCY,
Dirksen Office Building,
U.S. Senate, Washington, DC.

DEAR SENATOR PERCY: As a public witness at the Committee on Foreign Relations' recent hearings on chemical weapons proliferation, I would like to take the opportunity to add one point to my testimony.

You will recall the committee's considerable interest in the issue of verifying a chemical weapons arms control agreement without damaging economic well-being or trade secrets in the chemical industry. The committee may be interested to examine a relevant precedent. As you know, the post-WWII remilitarization of West Germany has been overseen by the Western European Union. West Germany is specifically forbidden from possessing the so-called ABC weapons—atomic, biological, and chemical. To enforce that commitment, the WEU regularly inspects the West German chemical industry with an international team. It is my understanding that the West German chemical industry believes that trade secrets have been protected and that the costs of their compliance to this internationally verified arms control agreement have been nil. Their experience should be an important precedent for the way we view stringent verification provisions and for the way the American chemical industry assesses the prospect of arms control.

Thank you for this opportunity to comment.

Sincerely,

BRAD ROBERTS,
Fellow in International Security Studies.

The CHAIRMAN. Thank you very much, both of you, for your fine testimony. At the outset of the hearing, I mentioned in my opening comments two approaches that we are taking in dealing with this threat. The first is the approach that we used this year in presenting a draft treaty to accomplish our purpose at the forty nation Committee on Disarmament in Geneva, namely, to ban the weapons totally and destroy all existing stockpiles.

Do you feel this is a realistic, practical thing? Do you think it is something that with diligent effort on our part and the part of like-minded nations we can accomplish in our lifetime?

Mr. ROBERTS. Yes, sir, I do. I believe that the major participants in the Committee on Disarmament face compelling incentives for seeking an effective ban on these weapons. The costs to the Third World of proliferation are horrendous. The costs to this country would be equally unpalatable. Even the Soviets must be ill inclined to see a world in which they are surrounded by states equipped with weapons of mass destruction or their near equivalent and who may use them against the Soviet Union.

So, the incentives are there. I agree with the Ambassador that it is going to take a little while to get from where we are today to an ideal end. I think we have made a reasonable proposal to the Soviets, and do not view the anytime, anywhere provision as a killer amendment, as Senator Biden coined the term. It is my understanding that this provision is widely deemed necessary by the participants in the Committee on Disarmament because of the unique characteristics of chemical weapons, their production and use, which makes them considerably more difficult to verify than, for example, strategic nuclear systems.

In sum, I believe that we have made a realistic proposal, and that it remains for us to work together with the developing coun-

tries in the Committee on Disarmament to bring the Soviets closer to the point of view that we have taken.

The CHAIRMAN. Ambassador Flowerree.

Ambassador FLOWERREE. I think I would also agree with the general thrust of Mr. Roberts' remarks about the ability to attain a treaty. I earlier expressed some doubt about the acceptability of the anywhere, anytime inspection to other countries besides the Soviet Union. In order to get a multilateral treaty, we want to get as many countries as possible on board.

Some of those countries will be countries who have difficulty in accepting a free and open kind of inspection that we are willing to accept, albeit with some reservations about what it might do to our industry. Nevertheless, I think that we should use the provision that is in the treaty now to test the waters, to see how far we can go, and see then if it is necessary to make some kind of modification to it in order to get the treaty.

After all, I think there is one thing we have to remember. In any multilateral treaty, there is really no enforcing mechanism available. What one depends on is the weight of world opinion and the self-interest of the countries involved.

If a country is violating a treaty, and it is challenged, and it refuses to let inspectors come into its territory, then, of course, it loses politically. Even the Soviet Union, I think, at times finds that it is awkward if there is a general consensus of world opinion against its activities. So it may be possible to have a provision for onsite inspection which is somewhat less rigorous than that proposed in the treaty.

The CHAIRMAN. I thank you for that response.

The second approach I mentioned is to try to prevent the spread of any further chemical weapon manufacturing capability. Certainly here the problem is somewhat different than in nuclear proliferation. It is harder to detect. Do you think it is possible in our lifetime with proper resolve and proper cooperation of like-minded countries to prevent the spread of chemical weapon manufacturing capability in the world?

Mr. ROBERTS. No, sir. I think to do so requires that we curtail the development process internationally. It requires that we curtail the proliferation, if you will, of the petrochemical industry, of the fertilizer industry, of the pharmaceutical industry. Those plants are precisely those which produce or can be readily adapted to produce with little expertise the kinds of weapons that we are seeking to ban.

As difficult as it would be to curtail the means to produce chemical weapons, it would be even more difficult to control the materials used in chemical weapons production. Nuclear materials are relatively few and far between, thankfully, but chemical precursors are of many hundreds of varieties. To effectively constrain their trade internationally would be to make the international economy bear a considerable cost. This does not mean, however, that we cannot have effective arms control.

The CHAIRMAN. Thank you.

Ambassador Flowerree.

Ambassador FLOWERREE. If I may, I would develop that a bit further. I think, of course, the major instrument that we have which

might possibly curtail the spread of weapons would be an international treaty, because the treaty would make provisions for inspecting what is going on in various chemical plants around the world.

But we could also, I think, make it somewhat more difficult for countries to achieve a chemical weapons capability. There are, after all, a great many things they have to do after they have simply produced the chemicals. They have to produce them in bulk. They have to be able to load them into effective delivery vehicles and the like.

So, by controlling, of course, the chemical agents themselves, and perhaps the immediate precursors, we would at least add an element of difficulty, but I would certainly have to agree that there is no way we could completely shut off the capability in Third World countries.

The CHAIRMAN. Ambassador Flowerree, I have a two-part question. Are you convinced that Iraq has chemical weapons?

Ambassador FLOWERREE. Yes, I am.

The CHAIRMAN. Second, world opinion has been quick to condemn Iraq for the use of mustard gas and nerve gas. Why has world opinion been more cautious in condemning the use of yellow rain?

Ambassador FLOWERREE. Well, for one thing, the use of chemical weapons by Iraq against Iran is almost an open-and shut-case. The United Nations inspection team was able to get out there to be conducted to the scene of hostilities, to examine munitions, to examine victims almost immediately after they had been exposed to chemical agents. This made it very easy to prove the case.

In Southeast Asia, just to get a victim to the site of a place where he can be examined means traveling through jungle over very difficult routes, and it takes a great deal of time, during which time some of the body symptoms change and the immediacy of the evidence loses a great deal.

The second thing is, there are countries in the world who believe that any accusation we make against the Soviet Union is simply part of the cold war rhetoric, and they demand a higher degree of proof that what we are doing is not simply bashing the Soviets, but finding something that is really evidence of the use of chemical weapons.

I myself am personally convinced that they have been used in Southeast Asia. I was involved early in the Carter administration when we took a very skeptical view of the initial reports, but they kept growing and growing, and the evidence was interlocking from various sources. We felt that it was a body of evidence that simply could not be ignored, and I was happy to hear that Mr. Adelman even approved of what we did in the pre-1981 period to try to bring this evidence before the world.

Mr. ROBERTS. May I comment on that?

The CHAIRMAN. Yes. And could you add to your comment a question on Libya and whether or not chemical weapons can be effectively used as weapons of terrorism, and whether you believe Libya possesses or is it seeking to acquire the capacity and capability for chemical warfare?

Mr. ROBERTS. I cannot speak definitively to the Libyan case. It has been alleged in the Western press in a number of places that

Libya has received shipments of chemical weapons. Chemical weapons could be very appealing to terrorists. They have two things that make them particularly appealing. One is that they are low tech—they are easy to use. They present certain threats to the user if he is not prepared, but they are considerably easier to get hold of and use than nuclear or high tech weapons.

Chemical weapons have another main characteristic that is desirable, and that is that they have a very high shock value. The instances of chemical terrorism that have occurred demonstrate the potency of this shock value. The injection of 10 or 12 Israeli oranges with mercury that were then spread throughout the European markets led, of course, to the collapse of that sector of the Israeli economy for a while simply because of the fear that it instilled throughout the public in northern Europe.

So, I think they do have a very great appeal to terrorists. Yes.

The CHAIRMAN. I want to thank both of you very much for your appearance. With your permission, we may submit additional questions to you for your responses for the record, and maybe other Senators who could not be with us today may have questions for you. We very much appreciate your testimony on this very vital and important subject.

Thank you both very much.

This hearing is adjourned.

[Additional questions and answers follow:]

AMBASSADOR FLOWEREE'S RESPONSES TO ADDITIONAL QUESTIONS SUBMITTED BY SENATOR BIDEN

Question 1. What led Iraq to risk using chemical weapons?

Answer. I can only speculate on Iraq's motives, but it seems likely that the Iraqis had been looking for a means of overcoming Iran's manpower advantage and that chemical weapons seemed to offer a possibility lying within Iraq's technical and military capabilities. In taking the decision to use them Iraq probably anticipated an unfavorable world reaction, but calculated that this would not endanger the level of conventional weapons support being provided by its current suppliers.

Question. 2. The United States approached the Iraqis on several occasions in the hope of halting their use of chemical agents. These efforts failed. In retrospect, is there anything else we should have done or done differently?

Answer. I am not privy to all the actions that may have been taken by the United States Government prior to Iraq's use of chemical weapons. One action we might have taken, an early cutoff of the delivery of critical chemicals, might have had some impact. The success of such an action, however, would have depended heavily on our ability to get the cooperation of other chemical exporting countries which would have been difficult before the case was proven and impossible in the case of the Soviet Union.

Question 3. Do you believe that Iran will soon acquire and use its own chemical warfare capabilities?

Answer. Iran now has an excuse for moving to develop chemical weapons and the temptation to do so may be strong. However, the Iranians might prefer to devote their resources to other military measures which they would view as more cost effective while dealing with the CW threat by relying on international political pressure to deter Iraq from further use. If the Iranians were to acquire a CW capability, I have little doubt that they would use it should the opportunity present.

Question 4. What risks do you see of the spread of chemical warfare agents throughout the Middle East?

Answer. I have no special knowledge about the direction of military planning by Middle Eastern countries. I would suspect, however, that the prospects for the spread of chemical warfare capabilities among the countries of this region are fairly high so long as the threat of continuing armed conflict hangs over them.

Question 5. If chemical warfare capabilities spread throughout the Mideast region, what would be the effect for Western security? Would it compromise the West's ability to defend the oil routes through the Gulf?

Answer. To the extent that chemical warfare capabilities became widespread throughout the region tensions would probably be heightened. I see little direct effect, however, on the West's ability to keep open the Straits of Hormuz. If a general regional war were to break out, the possibility of chemical weapons being used would, of course, add a complicating factor.

[Whereupon, at 11:59 a.m., the committee adjourned, subject to call of the Chair.]

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